RAILROAD GAZETTE

FRIDAY, MAY 24, 1878.

Train Accidents in April.

The following accidents are included in our record for the month of April:

REAR COLLISIONS.

Early on the morning of the 5th a freight train on the Lehigh Valley road stopped to cool a hot box at Slatington, Pa. The usual signals were made, but failed to stop an oil train, which was following close behind, and it ran into the rear of the freight. By the collision the first oil tank was thrown over on the engine and broken, and the oil at once caught fire and exploded, almost destroying the engine and scattering the burning oil in every direction. Part of the oil train was hauled back and saved, but five cars were completely destroyed with some of the freight cars and some adjoining buildings; a bridge close by was also burned, letting several cars down into the creek. While the cars were being run back, another oil tank exploded, burning a large number of people. The fire burned for several hours, destroying railroad and other property valued at $75,000, including the bridge and buildings. By the collision itself only three trainmen were hurt, but the fire and the oil explosions burned four persons so that they afterward died, and 16 others less severely. It is said that the oil train could have been stopped, had proper attention been paid to the signals. It was nearly 12 hours after the collision before the fire subsided enough to allow the railroad men to go to work at the wreck.

On the night of the 5th a freight train on the New York Central & Hudson River road ran into a preceding freight at Tivoli, N. Y., wrecking four box cars and damaging several others.

On the 6th an extra freight train on the Chicago, Burlington & Quincy road ran into a preceding freight, which was stopping at Princeton, Ill. The engine and several cars were badly broken.

Early on the morning of the 9th a freight train on the Chicago, Burlington & Quincy road ran into some cars which had broken loose from a preceding freight near Whitfield, Ia., damaging several cars. A brakeman, who was on top of a car was thrown under the train and killed, and two drovers in the caboose were slightly hurt.

On the evening of the 9th a passenger train on the Peoria, Pekin & Jacksonville road ran into some freight cars which had been blown out of a siding in Jacksonville, Ill., by a high wind. The engine and three cars were badly damaged.

Early on the morning of the 26th a freight train on the Richmond & Danville road ran into the rear of a passenger train, which had stopped near Clover, Va., to cool a hot box. The freight engine was damaged, a sleeping car wrecked, one passenger fatally and four less severely hurt. It is said that no signal was sent back by the passenger train.

On the night of the 26th a freight train on the Wabash road ran into some cars which had broken loose from a preceding freight near Decatur, Ill. The engine and a number of cars were damaged and the engineer badly hurt.

BUTTING COLLISIONS.

On the night of the 11th a freight train on the Wabash road ran over a misplaced switch and into the head of another freight, which was standing on a siding at Sangamon, Ill. Both engines and several cars were badly broken and one man hurt.

On the afternoon of the 22d, in Springfield, Mass., a Boston & Albany passenger train ran over a misplaced switch and into the head of a passenger train on the Springfield, Athol & Northeastern track. Both engines and a baggage car were damaged, three trainmen and a passenger slightly hurt. The switchman who left the switch open had been 25 years with the company, but was promptly discharged

On the night of the 24th, as a passenger train on the Cleveland, Columbus, Cincinnati & Indianapolis was passing a freight train on a siding at Farmland, Ind., a brakeman threw the switch over too soon and the rear passenger car was thrown over on the siding and against the freight engine. The engine and car were badly damaged and five persons hurt.

DERAILMENT, BROKEN RAIL.

On the 13th the engine of a freight train on the Erie Railway was thrown from the track by the breaking of a guard-rail in the yard at Hornellsville, N. Y.

DERAILMENT, BROKEN WHEEL.

On the 2d, as a freight train on the Nashville, Chattanooga & St. Louis road was coming down the grade on the Cumberland Mountain, Tenn., a wheel broke and four cars were piled up together, blocking the road all night.

DERAILMENTS, BROKEN AXLE.

On the 12th an axle broke under a freight car in a Boston & Albany train while on the Eastern track, in Chelsea, Mass., and five cars were thrown from the track and wrecked, blocking the road for some time.

On the 16th a passenger train on the College Hill Railroad was thrown from the track by a broken axle under a car near College Hill, O.

On the evening of the 18th a car of a freight train on the Philadelphia & Reading road was thrown from the track near Exeter, Pa., by the breaking of an axle. The car was carrying pig iron and is said to have been overloaded.

On the night of the 19th the engine of a freight train on the East Tennessee, Virginia & Georgia road was thrown from the track at McMillan's, Tenn., by the breaking of a driving axle. The axle broke close to the hub of the wheel, and the wheel tore out the rods on that side and ran off 30 feet into a field.

DERAILMENT, BROKEN TRUCK.

Early on the morning of the 17th the tender of a passenger train on the Savannah & Charleston road was thrown from the track near Grahamville, S. C., by the breaking of a truck. The train was delayed five hours.

DERAILMENTS, BROKEN BRIDGE.

Very early on the morning of the 8th, a passenger train on the Chicago & Northwestern road went through a bridge over the Baraboo River, near Reedsburg, Wis., which had caught fire in some way and was partly burned through when the train struck it. The engine, tender and baggage car went down into the river in a heap and were badly wrecked, but all the passenger cars kept on the track. The fireman was killed, the engineman and express messenger badly hurt. The bridge is close to a sharp curve, so that the engineman could not see it until he was close upon it.

On the evening of the 22d the engine of a coal train on the Seattle & Walla Walla road jumped the track on a bridge at Black River, Wash. Ter., and the bridge gave way, throwing the engine and one car into the river. The bridge was a wooden truss, of 60 feet span.

DERAILMENTS, SPREADING OF RAILS.

On the night of the 18th, five cars of a freight train on the Central Railroad of Minnesota, were thrown from the track and wrecked near Mapleton, Minn., by the spreading of the rails, blocking the road for a whole day.

Early on the morning of the 22d a freight train on the St. Louis, Iron Mountain & Southern road, ran off the track near Hematite, Mo., and nine cars went down a bank and were wrecked, killing a tramp, who was stealing a ride, injuring another fatally and two more less severely. The accident is said to have been caused by the spreading of the rails.

DERAILMENTS, WASH-OUTS AND LAND-SLIDES.

On the morning of the 3d, a freight train on the Chicago & Lake Huron road, went into a washed-out culvert near Davison, Mich., and eight cars were piled up and badly broken.

On the night of the 12th, the engine of a passenger train on the Vermont Division of the Portland & Ogdensburg, was thrown from the track by a wash-out near Johnson, Vt. The engine upset and was damaged.

On the morning of the 23d a freight train on the Missouri Pacific road ran into a land-slide near Washington, Mo., ditching the engine and several cars.

On the evening of the 23d a passenger train on the Alabama Central road went into a washed-out culvert near York, Ala., and the engine went down, the tender being thrown over on top of it and the first car piled up on the tender. Both engineer and fireman were killed.

DERAILMENTS, ACCIDENTAL OBSTRUCTION.

On the night of the 22d, as a coal train on the Erie & Pittsburgh road was passing through Linesville, Pa., a drawhead broke and fell on the track, throwing off three cars. The cars ran into a section house near the track and both cars and house were badly broken.

On the morning of the 23d the engine of an express train on the Baltimore & Ohio road was thrown from the track near Baltimore, Md., by a piece of a car wheel which had lodged on the track, and was supposed to have been left by a freight train. The road was blocked five hours.

DERAILMENTS, CATTLE.

On the 9th an express train on the Oregon & California road ran over a horse near Portland, Or., and the engine and two cars were thrown from the track. The engine upset and was badly damaged, injuring the engineer and fireman.

On the 17th the engine of a passenger train on the Central Railroad of Georgia was thrown from the track near Atlanta, Ga., by a cow which had got upon the track. The road was blocked some hours.

DERAILMENT, WIND.

On the night of the 13th a stock train on the Atchison, Topeka & Santa Fe road was blown from the track by a tornado near Emporia, Kan., and a number of the cars were wrecked.

DERAILMENTS, UNEXPLAINED AND MISCELLANEOUS.

On the night of the 1st a car of a passenger train on the Nashville, Chattanooga & St. Louis road jumped the track and upset near Waverly, Tenn., injuring three persons slightly.

On the 6th a car in a passenger train on the Erie Railway ran off the track near Carrollton, N. Y.

On the 8th a palace car attached to a train on the North Pacific Coast road jumped the track near Nicasis, Cal., and went down a high bank into a creek. The car was wrecked, Mr. Eastland, President of the road, and his daughter badly hurt and three others much bruised.

On the night of the 8th a sleeping car in a Northern Pacific passenger train jumped the track and upset near Bismarck, Dakota, injuring three passengers.

On the 10th a passenger train on the Cincinnati, Richmond & Fort Wayne road ran off the track at Winchester, Ind.

On the 10th several cars of a coal train on the Lehigh Valley road ran off the track and were wrecked near South Somerville, N. J., blocking the road several hours.

On the evening of the 11th a freight train on the Intercolonial road ran off the track near Maccan, N. S., blocking the road several hours.

On the afternoon of the 15th a freight train on the Missouri, Kansas & Texas road ran off the track near Windsor, Mo., wrecking the engine, killing the fireman and injuring the engineman badly.

About noon on the 16th five cars of a coal train on the Allegheny Valley road ran off the track in Pittsburgh, Pa., and two of them were wrecked.

On the morning of the 17th a car of a freight train on the Atchison Branch of the Chicago & Southwestern road ran off the track on the approach to the Missouri River bridge in Winthrop, Mo., blocking the road several hours.

On the morning of the 24th a timber car on the Pensacola Railroad ran off the track in Pensacola, Fla., and ran against the car-shed, doing some damage.

On the night of the 27th the engine and one car of a freight train on the Kansas City, St. Joseph & Council Bluffs road ran off the track near Weston, Mo., and were much damaged.

On the 29th four cars of a freight train on the Fort Wayne, Jackson & Saginaw road ran off the track at Fremont, Ind., and were badly damaged.

OTHER ACCIDENTS.

On the evening of the 2d, as a passenger train on the Philadelphia, Germantown & Norristown road was near Spring Mill, Pa., a key in the piston-rod dropped out and the piston was driven against the cylinder head, knocking it out.

Very early on the morning of the 10th the passenger car attached to an express freight train on the Lehigh Valley road caught fire near Chain Dam, Pa., and was entirely destroyed. The car belonged to the Reading road, and is said to have caught fire from the stove, which was placed under the car, as in all of that company's passenger cars.

On the evening of the 15th as an express train on the Delaware & Bound Brook road was near Hamilton, N. J., a connecting rod broke, damaging the engine, tearing up the running board, breaking the cab, and injuring the engineman badly.

This is a total of 46 accidents, whereby 12 persons were killed and 55 injured. Seven accidents caused the death of one or more persons; nine caused injury less than death, while in 30, or 65.2 per cent. of the whole, there was no person hurt sufficiently for record.

As compared with April, 1877, there is a decrease of 23 accidents, and of one in the number killed, and an increase of 21 in the number injured.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:		
Rear collisions	7	
Butting collisions	3	
		— 10
DERAILMENTS:		
Unexplained	13	
Broken rail	1	
Broken wheel	1	
Broken axle	4	
Broken truck	1	
Broken bridge	2	
Spreading of rails	2	
Wash-out	3	
Land-slide	1	
Accidental obstruction	2	
Cattle on track	2	
Wind	1	
		— 33
Broken connecting rod		1
Broken cylinder head		1
Car burned while running		1
Total		46

Three collisions were caused by misplaced switches; two by trains breaking in two; two by failure to observe or obey signals promptly, and one by cars blown out of a siding. One of the broken bridges recorded was partly burned through by a smouldering fire; the other failed to withstand the shock of an engine off the track. There were 17 accidents chargeable directly to defects of failure of road or equipment.

There was one collision between passenger trains, three between a passenger and a freight, and six between freight trains. Thirteen derailments were of passenger, and 20 of freight trains, and of the other accidents two were to passenger and one to a freight train. The ten collisions killed six persons and injured 36; the 33 derailments killed six and injured 18, while in the three other accidents one man was hurt. Persons were killed or injured in seven out of 10 derailments, and in only eight out of 33 derailments.

The month's record is notable only for its shortness, and especially for the very small number of collisions, the proportion of those accidents being the smallest of any month that we can now recall. An unusual feature is the absence of derailments caused by misplaced switches, though three collisions resulted from this kind of carelessness. The breaking of one axle is said to have been caused by the overloading of a car, but unfortunately neither the weight carried by the car nor the size of the axle is recorded. The number of broken axles is considerable.

For the year ending with April the record is as follows:

	No. of Accidents.	Killed.	Injured.
May	46	12	41
June	49	16	92
July	53	21	144
August	98	46	220
September	84	20	88
October	82	31	112
November	83	23	70
December	66	8	26
January	75	23	77
February	67	8	31
March	49	5	14
April	46	12	55
Totals	798	225	970

The averages per day for the month were 1.53 accidents, 0.40 killed, and 1.83 injured; for the year they were 2.19 accidents, 0.62 killed, and 2.66 injured. The average casualties per accident were, for the month, 0.261 killed, and 1.196 injured; for the year, 0.282 killed, and 1.216 injured.

Report on Locomotive Tests.

[Report of the Committee of the Master Mechanics' Association on Locomotive Tests, presented at the eleventh annual convention in Richmond, Va., May 16, 1878.]

To the American Railway Master Mechanics' Association:

Your committee, re-appointed at the last annual convention held in St. Louis, to report on the subject of locomotive tests, would respectfully report that they sent out circulars asking for replies to the following questions:

"1st. Have you made comparative tests with the eight (8) wheel, Mogul, ten (10) wheel or Consolidation engines, and which, in your experience, is best adapted for general freight service?

"2d. Please furnish statement of tests as to number of cars hauled by each class; give weight and dimensions of each kind of locomotives; pressure carried; kind and quantity of fuel consumed; miles run; kind of exhaust, single, double or variable; diameter of nozzles; condition of road, grades, curves, etc.

"3d. Please give results of any tests of a general character that will be of interest and value to the Association. The committee respectfully request the members to give the Association the benefit of their experience relative to the above subject."

(Signed by members of Committee.)

In answer to the above, we have received eight replies, and while they do not all furnish data from which to make up a report, yet your committee feel encouraged, as they believe the members are becoming interested, and see the benefit to be derived from conducting these experiments and having them placed on record. It is desirable to know, and in fact we should know, just what our engines are doing as regard economy in fuel and service performed, which class or style of engine gives best results, all things being considered. These are practical facts we should know, and especially in these times, when our railroad managers want everything worked down to the finest point, or, in other words, to get all out of our engines that we can, and your committee believes that it is by these experimental tests that we shall arrive at such facts as are desirable.

Mr. Johann, of the Wabash Railway, has furnished your committee with a very complete report bearing on the above subject, viz., to determine just what amount of service the engines were performing on their road, they having but one class. We respectfully submit the paper as part of our report, and recommend that it be printed.

Mr. D. L. Weaver, of the Eastern Kentucky, Railroad reports a comparative test between a Mogul engine, 17×24 in. cylinder, and an eight-wheel engine, 16½×24, on a grade 85 feet to the mile. The Mogul engine hauled up this grade 181 tons freight, not including weight of cars and engines; he reports this is one-third more, or 121 tons, than they can draw with the eight-wheel engine. The Mogul used 5 per cent. more coal, and 2 per cent. more for cost of repairs than the

eight-wheel engine; weight of Mogul engine, 34 tons; eight-wheel engine, 31 tons.

In reference to the objections made by some parties as to the Mogul engine being rather hard on the road or curves, Mr. Weaver says they have some 15-degree curves, and the Mogul engine ran on them without any difficulty whatever. The Roadmaster also states they are not any more severe on curves than eight-wheel engines.

Mr. Weaver is very much in favor of the Mogul engine, from the facts developed, that he gets one-third more freight hauled than he does with the eight-wheel engine, and with only a very slight increase of cost.

Mr. Wells, of the Jeffersonville, Madison & Indianapolis Railroad, states that their freight engines are all of the eight-wheel pattern, consequently he could not make comparative tests with other patterns of engine. Yet, as your committee has asked for information of a general character, in connection with comparative tests, Mr. Wells has furnished a statement of average work performed for the past year by engines of the above pattern, viz., cylinders 16×22 in., 16×24 in., and 17×24 in., driving wheels 5 ft. diameter; travel of valve, 4¾ to 5 in., exhaust nozzles double, 2¾ to 3 in. diameter; weight of engines, 60,000, 65,000 and 70,000 lbs., with two-thirds of the weight on drivers. The average load hauled per train-mile was 19.42 loaded cars, three empty cars estimated equal to two loaded, mileage per ton (2,000 lbs.) of coal, 28.74; grade 30 to 50 ft. per mile; quality of coal used, Indiana block coal.

Mr. Hewitt, of the Toledo, Peoria & Warsaw Railroad, says he has made no tests, with but one exception, which was to determine the difference between single and double exhaust nozzles. He gives no data, however, but states the single nozzle gives the best results.

From the data received your committee cannot arrive at any definite conclusions as to which is the best class of engine for freight service; yet comparisons may be drawn by members of the Association having engines of the same class from which the above statements are made.

In addition, your committee beg leave to present the following papers, comprising a report of a number of very interesting tests and experiments, conducted and furnished by John E. Martin, Master Mechanic of the Chilian & Talcahuano Railway, of Chili, S. A.; these papers are accompanied with diagrams, drawings and indicator cards.

Mr. Martin made these experiments with the view of ascertaining the best plan or arrangement of valves, etc., for the better distribution of steam in the cylinders of locomotives in their regular work, making comparisons or tests with long and short ports. These experiments have been conducted in a very thorough manner, as the members will see by the papers, etc., furnished. Mr. Martin also sends a statement of tests made with grate bars, with reference to the admission of air in the consumption of coal, best plan of using dead plates and other appliances in fire-box, etc.

Your committee would state the above was received after they had made up their report, but they would respectfully recommend that these papers be included, and also that the whole be printed in the next annual report.

Your committee desire to express their thanks to Mr. Martin, and also to Mr. Johann, of the Wabash Railway, for papers, drawings, etc., furnished. Your committee is of the opinion that this is a subject worthy of still further investigation, and recommend that members continue to make such tests as they may find convenient, and furnish the results to the Association.

Very respectfully, WM. WOODCOCK,
S. A. HODGMAN,
DAVID CLARK,
Committee.

LOCOMOTIVE EXPERIMENTS ON THE WABASH RAILWAY, WESTERN DIVISION.

The following communication was addressed to the Committee on Locomotive Tests by the Master Mechanic of the Wabash Railway, and submitted with their report:

"As we have but one type of engines on this road the ordinary eight-wheeled American engine, four drivers and truck, I am not in a position to furnish data as to the comparative value of the different types of locomotives.

"Last fall, however, desiring to ascertain the actual work performed and capable of being performed by our standard freight engines, as also the effects of the different laps and leads, I determined to make some experiments tending to such results.

"Charles A. Smith, C. E., Professor of Civil and Mechanical Engineering at Washington University in St. Louis, Mo., kindly volunteering his services and the use of the indicators to conduct such experiments, I fitted up an engine for this express purpose.

"Under his supervision over 200 indicator cards were taken, and the following report is a presentation of the results obtained by him.

"Hoping that they will be of some interest and value to the Association, I herewith place them at your disposal to do with them as you think proper.

"Very respectfully yours,
"JACOB JOHANN, Master Mechanic."

WABASH RAILWAY, WEST DIVISION—REPORT OF EXPERIMENTS WITH ENGINE 180, DEC. 1 AND 2, 1877.

On Saturday, Dec. 1, 1877, engine 180, which had just been thoroughly repaired, was sent on an experimental run with second-class train, No. 56, from East St. Louis to Decatur, a distance of 110 miles, and returned the following day with a through extra from Decatur to East St. Louis.

During the night at Decatur her valves were set with ,½ in. more lead than on the preceding day, and the two trips with their resulting data are distinguished as "A" and "B."

On account of the severe weather at that time prevailing no further experiments were then made, but it is proposed to continue them in the Spring, using valves of different laps.

Description of Apparatus and Method of Noting Experiments.—The engine was fitted for the especial purpose of the experiment, with two wooden seats on the front plate, as shown in the *Railroad Gazette*, Vol. 6, page 221; but the backs were continued up as high as a man's head when seated in them to shield the observers from the wind.

Two Richards' indicators were used on each cylinder, fitted with stop-cocks, so as to take steam from either end of the cylinder at pleasure.

The motion for the paper cylinder was derived from the crossheads as shown in the illustration already referred to in the *Railroad Gazette*.

A counter was attached to the running board on the right side of the engine, the motion being derived from the crosshead in the same manner as for the paper cylinder, for the purpose of ascertaining the piston speed of the engine; but after running 20 miles on trip A, it stopped working, owing to a pin slipping from its place. After that the number and time of passing each mile post was noted and the piston speed averaged between each mile post from these data.

A time record was also kept of the steam pressures, the sector notches and the water consumption. The latter was determined by a wooden float, similar to the one described on page 137 of the Master Mechanics' Association Report of 1876.

This float worked in a six-inch pipe, which was sunk through the top of the tank just in front of the man-hole and reaching nearly to the bottom of the tank. This served not only as a guide for the float but checked the oscillations of the water under the float. By diminishing the orifice at the bottom of such a tubular guide, any required degree of steadiness in the gauge can be secured.

The height of the water was noted every five minutes, and from this the rate of consumption at any given time was determined.

The hydraulic traction dynamometer belonging to the Master Mechanics' Association was used during the greater portion of the trip each way, and its reading noted every five minutes while it was attached.

Indicator cards were taken quite frequently at the start of each run, and afterward at longer intervals until they were taken every five minutes. During the latter part of each trip only one indicator was used, the other having been disabled by the breaking of a spring. Two springs of 60 lbs. were broken, one on each day, and it is advisable to use stiffer springs, 80 lbs. or 100 lbs. to the lineal inch in place of 60 lbs.

On the trip from East St. Louis to Decatur the coal used was estimated on the basis of 50 lbs. per cubic foot, which was obtained by weighing a flat car and estimating by careful measurements the volume of the coal.

But this is probably too light a value, as the coal on the tender would average smaller sizes, hence the results for trip A are given in duplicate values based on 50 and 60 lbs. per cubic foot.

On the trip B, from Decatur to East St. Louis, the tank full of water, and then with water and coal, was weighed at the start and again with an equal amount of water at the finish, giving an undoubtedly correct value of the weight of the coal consumed on trip B, as sufficient was taken on to last through the trip.

The weight of each train was obtained upon the scales, on each trip at the end of the run.

By noting on each card as taken the time of taking, the steam pressure in the boiler, the position of the reverse lever, the speed of the piston and rate of water consumption at the time of taking any card became known.

Reduction of the Experiments.

1. *Indicator Cards.*—From the notes it was possible to find all circumstances occurring at the same time. The piston speed in feet per minute was found and noted on each card, and the indicated horse power computed in the usual way, and the results from the two ends of the cylinder added and noted on the cards.

All cards taken at a less speed than 12 miles an hour were neglected, and the others averaged for each trip. As the trains were heavy and the speed not high, the excess of power used in starting the trains was partially given back again in stopping, there being only a few brakes set in making stops. And as few stops were made, the excess of power really neglected is but a small portion of the whole amount exerted in the run.

Fuel and Water.—The reduction of the fuel and water data requires no explanation; but some explanation of the reasons for certain statements will be given later, with some comparisons with other results.

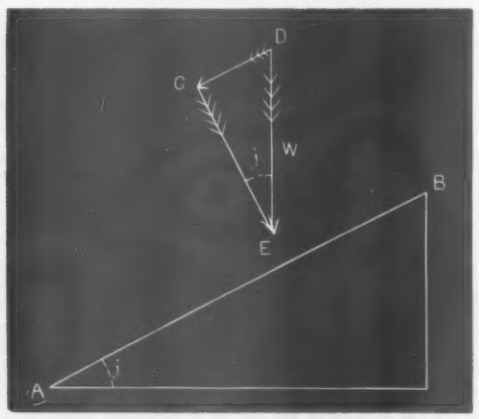
Dynamometer.—The reduction of the dynamometer readings is a matter of much greater length, and on account of its importance it will be more fully described.

The readings taken from the dial of the instrument were in tons and quarters of a ton, that being as close as the average of the fluctuations of the instrument could be noted. They were then tabulated with the time record, and from the time and mile post record the position on the road (*i. e.* between what mile posts) was found, and from the profile of the road the rate of grade at each observation.

From these data the co-efficient of traction on a level at the same speed as running (in other words, that portion of the load which it took to haul it on a level at that speed) was found by the formula:

$$f = \frac{t}{W} \mp \sin i, \text{ where}$$

f = the desired fraction, or the co-efficient of traction on a level.
t = actual traction in pounds.
W = the load hauled by the dynamometer in pounds; and
$\sin i$ = sine of the angle of inclination, or the rate of grade per foot (not per 100 feet), taken + or − as the grade was descending or ascending respectively.



In the figure, let $A\ B$ be a grade with an angular ascent of i.

Let W equal the load hauled by the dynamometer (*i. e.*, the weight of the train). Then, on a level, the force in pounds required to pull one pound = the whole force in lbs. exerted / weight of the train in lbs.

That is, $f = \frac{t}{W}$

$$W f = t.$$

On a grade the force required to pull the load is increased or diminished by that component, $C\ D$ of the load, which acts along the grade, according as the load is ascending or descending.

This component $C\ D = W \sin i$.

Hence on a grade the traction

$$t = W f \pm W \sin i;$$ from which

$$f = t \mp \frac{\sin i\ W}{W} = \frac{t}{W} \mp \sin i.$$

From these reduced values of f the average for each trip was found, neglecting special values in starting as before.

With the average value of f so found, the profile of the road was taken and reduced to equivalent level lengths, or a level length which would require the same amount of energy to haul the train over it.

$$\frac{\pm W \sin i \mp f W}{W f} = \frac{f \pm \sin i}{f} = 1 \pm \frac{\sin i}{f},$$

a co-efficient by which the value of the work done is increased on grades, and by which the length of the grades are to be multiplied to give equivalent lengths.

The length of each grade was then multiplied by this factor $1 \pm \frac{\sin i}{f}$, and the results added, the + and − signs being used for up and down grades respectively. This had to be done for each trip, the values of f being different from A and B.

From the reduced level length of the road, the total energy exerted in the run was found, by multiplying together the whole weight of the train (including the engine and average weight of the tender), the co-efficient of traction on a level, and the reduced level length of the road. This product is in foot-pounds, and was then divided by the running time on the road in minutes, omitting time consumed in stops, and the quotient or number of foot-pounds per minute reduced to horse-power by dividing by 33,000.

The "measured horse-power" so found, as an average value, was compared with the "average indicated horse-power" and the energy exerted by the consumption of one pound and 100 pounds of coal, found by dividing the total energy exerted on the run by the amount of coal consumed in pounds and in 100 pounds.

This method of averages, though liable to many small errors, is yet very reliable from the great number of observations from which the results are obtained, and though exceedingly tedious is completely justified by the results, and must be used in all cases where an autographic dynamometer is not to be had.

This method justifies the omission of the starting power, and takes in curves with their proper values.

NOTES UPON THE RESULTS.

The indicator cards show the valve gear to have been in excellent condition.

The lap of the valve was ¾ in. outside, 1/32 in. inside.

The lead of valve was in trip A 1/32 in., and in B 1/16 in. in full gear.

The temperature of the feed-water was about 40° F., and the steam pressure, 140 lbs.; this was closely adhered to during the two runs. The quantity of water evaporated at this pressure from 40° F., is reduced to an equivalent quantity from 212° F. (this being the customary standard), by the table in "Rankine's Steam Engine," p. 256.

The coal used is of the kind known in St. Louis as Illinois coal, and is not equal in its heating capacity to anthracite or good bituminous coal.

From experiments on the evaporative power of Illinois coal compared with anthracite, made at the St. Louis Water Works, it appears to have only two-thirds of the heating power of the latter, and the coal used on the two runs was more or less wet from the mine or from being exposed to moisture; but for the purpose of comparison, the evaporation on an anthracite basis is given.

The evaporation of the boiler may then be considered good, and for the sake of comparison certain other local experiments are given.

The measured energy exerted per one pound of coal consumed may be considered good, and nearly agrees with that given for an engine on the Lake Shore Railway in the *Railroad Gazette*, Vol. VIII., p. 317: but an accurate comparison cannot be made without more detailed information than there given.

The difference in the value of f for the two trips may be accounted for by the difference in the pressure of the wind, which, from observations at the St. Louis office of the United States Signal Service, although having nearly the same component velocity with the train on the same days, yet gave components at right angles to the track, on trip A of 2.9 miles per hour and on trip B of 14.7 miles per hour. Out on the Illinois prairies these velocities may have been exceeded, and at any rate a pressure of wind at 14 miles per hour, acting on a surface of about 70,000 square ft., must necessarily give an increased resistance.

The greatest traction noted on the dynamometer at which the driving-wheels began to slip was about 13,000 pounds, though the fluctuations were such as to touch in one case 15,000 pounds. In other places slipping took place at 12,000 lbs. The first value is an exceptional one and gives an adhesion of

$$\frac{13{,}000}{\text{W't of eng. on drivers}} = \frac{13{,}000}{42{,}800} = 0.3 \text{ nearly,}$$

which can be accounted for by the clear, cold weather and the fact that the tires had just been turned up.

If the energy per 100 pounds of coal be taken, it is what is usually known as the "duty" of an engine, and is easily expressed in millions of foot-pounds.

And such a method of comparison is usual in the tests and reports of the condition of pumping engines.

The value reached is a very good one when it is remembered that a locomotive is subjected to a very different class of conditions from a pumping engine.

Although the running time of trip A is slightly faster than B, much longer time was consumed in stops, and some spurting was indulged in.

Consequently the number of pounds of water per horse-power per hour is greater in A than in B.

Dimensions of Engine 180.

Schenectady shop No. 721:

Number of driving-wheels	4
" truck "	4
Length of driving wheel base	7 ft. 8 in.
Total wheel-base of engine	21 ft 4 in.
Total weight of engine in working order	67,700 lbs.
Weight on driving-wheels	42,800 "
" truck "	24,900 "
Weight of tender, empty	26,500 "
" " with water	45,600 "
" water per 1 inch in height	521 lbs.
Diameter of driving-wheels	5 ft.
" cylinders	16 in.
Stroke of piston	24 in.
Size of steam-ports	1¼ in. ×14 in.
" exhaust-ports	2¼ in. ×14 in
Greatest travel of valve	4¾ in.
Lead in full gear: Trip A 1-32 in.. B 1-16 in.	
Outside lap of valve	¾ in.
Inside " "	1-32
Length of grate	62 in.
Width "	35½ in.
Height of fire-box	61 in.
Number of flues	150.
Diameter "	2 in.
Length "	11 ft. ¼ in.
Material "	Iron.
Heating surfaces in fire-box	88.28 sq. ft.
" " in tubes	759.1 sq. ft.
Total heating surfaces	847.38 sq. ft.
Exhaust nozzles	Double.
Diameter	2⅜ in.
Diameter inside pipe of smoke-stack	16 in.

TABULATED RESULTS OF THE EXPERIMENTS.

Total weight of engine	67,700 lbs.
Weight on the drivers	42,800 "
" " " truck	24,900 "
Weight tank, empty	26,500 "
" " with water	45,000 "
" of water per 1 inch in height	521 "

	A trip.	B trip.
Weight of train excluding engine and tender	893,000 lbs.	700,000 lbs.
Weight of train including engine and tender	1,000,000 lbs.	900,000 lbs.
Indicated horse-power	260.6	289.4
Coal used	8,000 lbs. to 10,000 lbs.	11,100 lbs.
Water evaporated from 40° F.	49,755 lbs.	54,184 lbs.
No. of lbs. of water from 40° F. per 1 lb. of coal	6.2 to 4.9	4.9
Running time in min. for 110 miles	386 min.	385 min.
Measured co-efficient of traction (ton per ton)	0.0044 ton.	0.0064 ton.
Traction in lbs. per ton of 2,000 lbs.	8.8 lbs.	12.8 lbs.
Reduced level length of road in feet	605,282	524,767
Measured horse-power (incl. engine and tender)	220.5	237.9
Ratio of measured to indicated H. P., or efficiency of the engine	85 per cent.	82 per cent.
Consumed in friction of machine	10 per cent.	18 per cent.
Energy exerted in foot-pounds per 1 lb. of coal	272,311 ft. lbs.	
Energy exerted in foot-pounds per 100 lbs. of coal or duty of engine	27 millions ft. lbs.	

DEC. 1, 1877.—TRIP A.

Mean height of the barometer	30.373 in.
Mean temperature	26.2° F.
Velocity of the wind	6.8 miles per hour

Direction of the wind included at an angle of 25° with the general direction of the track.

DEC. 2, 1877.—TRIP B.

Mean height of the barometer	30.300 in.
Mean temperature	32.7° F.
Velocity of the wind	16 miles per hour.
Direction of the wind—inclined at an angle of 51 degrees with the general direction of the track.	

	A.	B.
Average running speed in miles per hour	18.0	17.1
Water evaporated per hour	8,156 lbs.	8,453 lbs.
" " " " per indicated horse-power	31.4 "	29.1 "
Coal consumed per hour		1,644 "
" " " per sq. ft. of grate		10.9 "

Equivalent evaporation on an anthracite basis, per 1 pound of coal from 212° F.

St. Louis Water Works, high service	7.00 lbs.
Engine 180—trip B	6.00 "
St. Louis Lead and Oil Works	5.67 "
Shickle, Harrison & Co	4.61 "

Grades of Road.

Maximum grade	48.6 ft. per mile.
Difference in level between highest and lowest points	285 feet.
" " " " Decatur and East St. Louis	257 feet.

VALVE MOTION—ENGINE 180.

Forward Gear.

Position of reverse-lever.	Travel of valve.	Lead.	Point of cut-off.	Exhaust relieved.
0	2 1/16 in.	1/32 in.	3 1/2 in.	12 1/2 in.
1	2 1/16 "	3/64 "	6 1/4 "	15 5/8 "
2	2 1/16 "	3/64 "	9 "	17 3/8 "
3	2 3/16 "	3/64 "	12 "	19 1/4 "
4	2 1/16 "	3/64 " full.	14 5/8 "	20 1/2 "
5	3 1/8 "	1/32 " scant.	16 1/2 "	21 3/8 "
6	3 1/8 "	1/32 "	19 5/8 "	22 1/2 "
7	4 3/4 "	5/64 "	21 "	23 1/16 "

INDICATOR CARDS.

The tracings of cards sent with this report are such as were taken when running at a good speed, with the lever in the first notch, although a few are sent with the lever in the other notches.

As will be seen from some of the diagram tracings, there is a great deal of waviness in the lines which should not be there; but this is undoubtedly owing to the lightness of the spring used—60 lbs. to the lineal inch—and to the fact that the inertia of the moving parts of the indicator has to be overcome, both in starting and stopping. This latter defect cannot be entirely overcome, but can be reduced to a minimum by diminishing the weight and number of the moving parts.

The first defect may be overcome by using a stiffer spring, say 80 or 100 lbs. to the lineal inch, and such a spring will be used in future experiments, especially on passenger runs.

The figures in the diagrams are the average pressures per square inch of piston surface, during the stroke.

The figures indicating the horse power are for both cylinders, by supposing the power exerted by the other cylinder is the same for the same instant.

For Finding the Speed of the Train from the Piston Speed (Noted on the Cards) use the Following Table.

No. of minutes in traveling one mile.	Piston speed in feet per minute.	No. of minutes in traveling one mile.	Piston speed in feet per minute.
1 3/4	756	3 3/4	353
2	661 1/2	4	331
2 1/4	578	4 1/4	311
2 1/2	529	4 1/2	294
2 3/4	481	4 3/4	278
3	441	5	265
3 1/4	407	5 1/4	252
3 1/2	378	5 1/2	221

PERFORMANCE OF AMERICAN LOCOMOTIVES.

EXTRACTS FROM A LETTER OF W. W. EVANS TO THOMAS HIGGINBOTHAM, ENGINEER-IN-CHIEF OF THE VICTORIAN RAILWAYS, AUSTRALIA.

LOCOMOTIVES.—I note what you say about them, and that those that I sent are doing good work. I was much pleased to find that you were running them on heavy work. I ought to have sent with them two sets of valves. I think we could arrange a set of valves for those engines that would when working on heavy traffic save another 2 lbs. of fuel per train mile.

* * * * * * * *

You say there is a prevailing impression that the American engines will not last over six to seven years. I propose to give you a few figures in this matter to show to those interested in such things. I some years since saw in an English paper, the *Railway News*, a statement of the mileage of engines in England. I was so astonished at the small figures that I sent and got some data of English and American engines, so I could compare them. This was in 1874. The figures were as follows, for 1873, and give averages for the year for all the engines they had.

ENGLISH RAILWAYS.	Miles.
London & Northwestern	15,415
Midland	18,808
Northeastern	17,290
Great Western	18,320
Total	69,833
Average of all	17,458

AMERICAN RAILWAYS.	Miles.
Boston & Albany	24,500
Erie	27,550
New York Central	26,933
Pittsburgh, Fort Wayne & Chicago	31,737
Total	110,720
Average of all	27,680

The above gives an average of 10,222 miles for the American engines more than for the English. This is decimally 58 per cent. greater duty, and it was done on inferior tracks, in a more severe climate, over steeper gradients and sharper curves, and with heavier loads. It must be admitted in making this statement that the English engines no doubt showed a greater average speed than the American, but with this admited they should show greater average mileage in the year. Let us look at some more average mileage: In 1876 the Illinois Central Railroad had 202 engines. They averaged 27,819 miles in the year. (See *Engineering*, March or May 19, 1876). In 1875 the Central Pacific Railway had 203 engines. They ran 5,676,030 miles. This gives an average of 27,960 miles. The report of the Missouri, Kansas & Pacific [Texas ?] Railway for 1876 gives the engine mileage of that railway as averaging 37,811. (This is a big figure, and I do not believe it.) *Engineering* for Nov. 10, 1871, pages 305 and 310, gives the average mileage of engines in England on 20 railways, for six months, as 9,168 miles. This for the year is 18,336. *Engineering* for May 11, 1877, gives the average mileage of 22 railways in England in 1876 as 17,934. In McDonnell's paper, No. 1,469, on "the Repairs and Renewals of Locomotives," read before the Institute of Civil Engineers Jan. 16, 1877, there are many statistics in relation to locomotives worthy of close study. On page 68 he gives the half-year mileage of 20 railways in England to July 31, 1876, the average being 8,812.07. For the year this gives 17,625. Facing page 36, he gives a table of mileage of 176 engines on the Great Southern & Western Railway of Ireland, which shows an average mileage for ten years of only 13,926. On page 41 he makes out that these 176 engines would last 11.95 years running 20,000 miles a year. On page 49 he says the average age of the Great Western engines was 6.1 years. On page 74 the President in his closing remarks, says: "Many engines had been killed earlier than they ought to have been, because the traffic had increased faster than the engines to keep pace with it." He also says on page 75, referring to the Northeastern: "That company had scarcely a spare engine: the engines were at work night and day." Now if this was the case, that the engines were at work night and day, I cannot understand how they come to have such low average mileage in a year as 17,000 to 18,000, particularly as the loads are light, the roads good, and the speed high.

The report of the Pennsylvania Railroad for 1874 shows the average of all their 786 engines, passenger and freight, to be for the year 25,263. One of these engines, No. 133, on Middle Division, is put down in this report as having run in the year, 83,820 miles on passenger trains. (They give the largest run of any engine on each division.) Thinking this might have been an error, I wrote to Mr. Ely, the Superintendent of Motive Power, to ask him if he could confirm this tremendous run. He writes me that this engine not only run the 83,820 miles as reported on passenger trains in 1873, but run 2,904 miles on freight trains. This makes 237½ miles a day for every day in the year, and is much the largest run ever heard of. You may depend on it that engines that can perform such duty are not toys or flimsy things. Taking 17,500 miles as the general average of engines in England, this mileage shows that this engine, No. 133, did 5½ years' work in one. This same report shows that a freight engine, No. 215, on the same division, ran 48,012 miles in the year.*

This Pennsylvania Railroad does not give the age of the engines or data to get it, but the Reading Railroad does; they give the No., class, weight, maker's name, date when first run, miles run in the last year, total miles run and service employed on. I will inclose a few figures on another sheet from the company's report of 1875, giving data up to the end of their official year, Nov. 30, 1874, when they had 403 engines.

The following named engines were all built by the Reading Railroad Company in their own shops. They were all passenger engines. They had been running from 15 to 20 years, and you will see that each of them did a large service in 1874. Taking 17,500 miles as a fair yearly average, these engines had been doing the equivalent of 23 to 26 years. I do not give the above figures as averages in any way. I selected them as giving large runs for the last year and large totals, and I would here state that I have been often on that railway and examined their engines. They are strong, cheap engines, roughly built. Some of these engines have five pairs of drivers coupled, that can run without complaint around curves of 300 feet radius. We have five such engines on the railways of the Consolidation Coal Company of Maryland, in which I have a large interest and was for years a director. They do us good service, haul immense loads, cheaply, and are easy on the track. I sent a photo of this class of engines to the Institution of Civil Engineers. When Mr. Conybeare, a member, was here he told me the gentlemen of the Institution in St. George street thought this engine a "myth." I took him over to the Reading Railroad and showed him they were not a "myth" I placed him by the side of a curve, the sharpest there, 600 feet radius, and told him to note that these engines run the curve without a squeak or groan.

No.	Class	Weight in Tons of 2,240 lbs.	When first run.	Miles Run. In year 1874.	Miles Run. Total to Date
23	1st	26.9	July, 1852	24,780	410,733
44	"	30.2	May, 1857	25,484	438,541
45	"	23.8	June, 1857	27,428	422,922
49	"	25.2	Aug., 1857	28,595	475,733
57	"	25.2	June, 1859	35,407	426,071
58	"	25.2	June, 1859	35,142	455,428

I inclose some letters written by Hudson, of Rogers' Works, which explain themselves:

"You are right about our engines looking light, but they are not so in reality; they can and do do their work, and live to an old age. Don't fear their living only six or seven years. Much of the life of an engine depends on various circumstances, such as having a good driver, good water, fuel without much sulphur in it, a good track to run on, mild climate, repairs when required, not over-loaded, and the fires urged to their utmost, moderate speed, etc. All these things tell on an engine." * * *

VICTORIA RAILWAY (AUSTRALIA).

Returns showing fuel consumed for the month of October, 1877, by English and Colonial-made goods engines, "6 wheels coupled" and American bogie engines, Nos. 162 and 164, running from Melbourne to Woodend and back, 97 miles.

No. of Engine.	Driver.	Train mileage.	Coal in cwts.	Consumption per train mile		Total mileage.
51	E. Brown	3,508	978	31.2		3,761
55	T. Crocket	3,147	955½	34.0		3,394
45	G. Burrows	2,989	936	35.3		3,167
89	M. Murry	2,627	833	35.5		2,828
35	A. Trott	3,088	993	36.0		3,292
61	R. Jones	3,272	1,112	36.9		3,641
53	W. Douglass	2,910	975	37.5		3,124
37	H. Alders	2,328	801	38.5		2,500
49	C. Cheevers	3,676	1,269	38.6		3,980
	Average	.....	.....	35.6		
162	J. Clark	1,873	582	34.8	American engine.	2,019
164	N. Graham	2,455	722	32.9	do.	2,618
	Average	.....	.....	33.8		
	Total	31,953	10,516½	35.6		34,324

Total mileage includes an allowance of 4 miles an hour for standing in steam and shunting at stations, etc.

* As further illustrations of actual performances of American locomotives, compare the following table of mileages run by thirteen locomotives on the Hudson River Division (New York to Albany) of the New York Central & Hudson River in the year 1877, as reported by Mr. Wm. Buchanan, Superintendent of Motive Power:

No. of Engine.	Service.	Miles run. During year.	Miles run. Average per month.
80	Passenger.	86,622	7,218
6	"	86,473	7,206
86	"	85,890	7,157
36	"	85,254	7,104
84	"	80,700	6,725
69	Freight.	79,322	6,610
33	Passenger.	74,039	6,170
10	"	69,433	5,786
65	Freight.	68,684	5,724
88	"	66,607	5,550
100	"	64,494	5,374
92	"	63,114	5,259
60	"	62,484	5,207
Total of 13		973,116	.....
Average		74,855	6,238

The total number of engines in service on this division in 1877 was 97, which made an aggregate mileage of 3,726,919 or an average 38,422 miles per locomotive. Mr. Buchanan also reports that Engine No. 33, in the fifteen months from Jan. 1, 1877, to April 1, 1878, ran 117,872 miles, an average of 7,858 miles per month, or at 26 working days per month, of 302 miles per day. If we subtract from this 15 months' mileage the mileage for 1877, reported in the above table for this same Engine No. 33, we have as the mileage made by this engine for the three months of January, February and March, 1878, 43,833 miles, which is 14,611 miles per month, and 487 miles per day, counting Sundays and all!—EDITOR RAILROAD GAZETTE.

Capital and Labor and Their Special Relations in Railroad Service.

[Paper read at the eleventh annual convention of the Master Mechanics' Association in Richmond, Va., May 16, 1878, by F. B. Miles of Philadelphia.]

Mr. President and Gentlemen of the American Railway Master Mechanics' Association:

You are respectfully invited to join me in examining, for a brief space, the general relations of capital and labor, and also their special relations in railroad service. At the very outset of our inquiry we are brought face to face with the GREAT LABOR QUESTION.

With most people, it has been hitherto the common practice to know and to think very little about this question; to disregard it, to ignore it, to leave it for somebody else to settle or to let it settle itself. And yet when rightly considered, there is hardly any subject before the community which is more worthy of our respect and study, or which is invested with a more sympathetic interest. It is not a new question. Ever since the time when among the earliest inhabitants of the earth some intelligent hunter, by the exercise of foresight and self-denial, saved some food or other commodity wherewith to hire his companions to hunt for him; or, since the first strong brave man was able, by superior strength and courage, to compel the services of weaker ones without compensation; from that time down through all the centuries, this great labor question has been underlying the whole history of human effort and human progress.

We can trace it in the Babylonian captivity and Egyptian bondage of the Israelites, in the systems of servitude of all ancient nations, in the Feudal system of the middle ages, in the serfdom of Russia and the Chinese coolie trade. In short, the "SLAVERY QUESTION," in every age and upon every soil and under every disguise, is found to be *only a part* of this vast and deeply interesting labor problem.

I must at once disclaim any ambition to offer a solution of my own for this question. My object is to interest you in it, as I am myself interested, to lay before you some of its most striking aspects, and, if possible, to point out the direction in which we ought to look for a solution. It may assist us greatly in this if we now go to the fountain head and inquire, "WHAT IS THIS LABOR AND CAPITAL?" Theoretically, or in the abstract, what we mean by "LABOR" is nothing less than human life—human life, or time employed in useful effort. Rather a serious matter you will observe.

And by CAPITAL we mean past human life and labor; or, former time and effort which has been saved and stored away for use.

All the capital in the world is that part of the world's labor which has been preserved and accumulated.

Strange as it may seem, they are therefore of the same nature and constitution. If not the same thing, they are at least the same kind of thing, labor being that of the present while capital is merely the labor of a former period. Their relations are therefore those of the labor of two different periods.

In practice, the general term labor includes all people who, having neither saved nor inherited capital, are obliged to live upon WAGES earned by their hand work. Having saved no capital themselves, their wages must therefore be paid

out of capital saved by other people. These other people are capitalists.

The origin of capital is saving. Those laborers who put by a portion of the results of their labor become capitalists. It matters not whether their savings are hundreds, or thousands or millions, so only that they are veritable savings. These savings are invested in property and accumulated. The laborers who thus originate capital are not of the common sort; they are an uncommon class of men, men who use their brains to think. They use not only their hands to work with, but also their brains; and, by so doing, they bring into their service not only the human body, but also that wonderful instrument the HUMAN MIND. They are called by some, as a term of reproach, "stingy men." The conclusion is certain, that the more stingy men a country contains, the more valuable it will become and the more moral also. As the great Doctor Johnson remarked, "Men are seldom more innocently employed than when they are making money." Stingy men never go on sprees and but seldom miss a day's work. In the custom of saving they learn to deny themselves many injurious luxuries. They are therefore generally healthy men. In short, they exercise the moral virtues of industry, temperance and fortitude (or self-denial). They are also called upon, in taking proper care of these savings, for the exertion of prudence, foresight and intellectual talent. They are the men who bring order out of chaos, who have produced civilization out of barbarism.

It is therefore unjust to say that capital represents the result of labor only. It represents the power of thought and the strength of virtue as well. The management of capital involves some of the most important questions that can exercise the human intellect.

One of the principal functions of capital is to pay wages. Capital may therefore be briefly described as riches in the market with money to hire labor. It is hardly necessary to observe that those who live by hand labor are generally poor. We may therefore regard labor as poverty in the market with time and effort for hire.

And so in the last analysis the social relations of capital and labor have come to be those of the rich and the poor; their business relations those of employer and employed, or of work and wages, and their financial intercourse that of a mutual bargaining in which each endeavors, as a matter of business, to make the best terms for itself.

The labor parties consider that their side has been getting the worst of this bargaining from the very beginning; that they have, however, gradually bettered their condition from age to age, and that the state of culture is now such as to warrant their obtaining a still further improvement in compensation, either as a share of the profits of capital, or an increase of wages.

The railroads, as the largest share of fixed capital in the country, are necessarily interested in this question, this antagonistic union, this hostile copartnership of labor and capital; this misunderstanding called the labor question. It is only necessary for us to recall for a moment the great strike of the summer of 1877, and the able address of our worthy President, in order to realize the gravity of the question. We find it is anything but a trifle.

For it is undeniable that, in many countries, the widely spread and growing discontent among the laboring classes has come to amount to hostility to the rights of capital and of property, and even to rich people as a class—"bloated bondholders" in particular. If it is shown by the repeated revolutions in France and the Communist struggle at Paris after the last Franco-Prussion war, also by the trades-union, communistic and international utterances in all the manufacturing countries.

Labor is evidently in earnest. It is under the full impression that its cause is just; that it has grievances and aims which are worth suffering for even to the verge of starvation.

At the present moment, while we are in session, there is an extensive strike prevailing in the north of England. Many thousands of working people are out of employment. The employers and employed are ranged against each other for the purpose of testing which is right, by ascertaining which can best do without the other. Which, in fact, has the most need of the other. This is the gist of the whole question, WHICH HAS MOST NEED OF THE OTHER? As there can be no effect without a cause, there must of necessity be an adequate cause for all this agitation and suffering, and a meaning in it and a reason for it worth knowing, if we could find it out. Why, then, is it that the labor which is of the present, and that of a former period, instead of working together for the best interests of both, are arrayed in opposition to test which most needs the other? Is there any sense in it? No, only selfishness and obstinacy and stupidity. That is, there is a great deal of human nature in it, viz., that part of human nature which keeps back progress—the obstructive part.

The question is before us. We are actually embarked in it; we are part of it; we must not shirk but face it like men and solve it if we can. It is facing us whether we like it or not, and there is no safety in flinching. What are the aims and grievances of the labor parties?

It might be humorously answered that labor's principal grievance was a *want of capital!* And the statement would be perfectly correct; it is just that. It might also be stated in one word, viz., poverty!

Reverting for a moment to our definition, it will be remembered that capital and labor were found to consist practically of the rich and the poor. And here is the great and insuperable difficulty of the labor question; for, say what we will, poverty IS slavery, and money IS free-will and independence. It is true that in this country we hardly know what poverty is. Even after seeing the tenement-house life in New York, it is still impossible for an American to realize the squalid depths to which abject poverty can descend in the slums of some of the large European cities.

While wealth enjoys power, liberty, luxury, leisure, this extreme poverty, worse lodged and fed than the rich man's horses, can with difficulty be kept from ignorance and degradation.

Therefore, the labor parties contend, it is evident their bargain with capital has been a hard one, and it is only natural and proper that they should now struggle for a larger share of the profits.

They declare that while this extreme poverty remains it is idle to say that slavery is abolished. Their principal aim is, therefore, the radical cure of this their chief grievance by nothing less than the TOTAL ABOLITION OF POVERTY. This is, in plain terms, the general principle of all the communist, socialist, trades-union, coöperative and other labor reform schemes that ever were or will be founded. In itself it is certainly a worthy and laudable object, with which we can heartily sympathize. It is the cause of humanity and true progress.

The methods, however, by which it is proposed to carry it out are principally three, viz., trades unions, communism and coöperation. Let us examine them.

The full development of the trades-union idea is to form a great international labor league, which shall extend over all countries, and comprise among its members the best workmen in every branch of labor. By this means they expect to control the rate of wages over all the working world, and thus eventually dictate terms to capital. For it will then be impossible, they argue, for capital to better itself, whether by changing its investment into other enterprises, by importing cheaper labor, or by removing into another country; and therefore, unless it remove wholly into another planet, it must submit to the demands of labor.

But in this grand international scheme, besides the difficulties inherent in the project, our trades-union friends entirely overlook the fact that the employers can, and will, and do, if they are forced into it, form combinations of their own, with the object of reducing wages. They are doing it in the present strike now going on in England. We have seen it successfully done against the Brotherhood of Locomotive Engineers in this country. It is quite obvious that, in a struggle of this kind between opposing combinations of employers and employed, that if the employers, being just as loyal and devoted, and much the more wealthy and powerful, as well as more intelligent and manageable body, must prove successful oftener than their opponents. For the employers are composed, in great part, of men who *were* the most intelligent and meritorious of the employed, and they are constantly recruited from them by men who, as we have already shown, are working their brains to think and who have the foresight to save up capital.

After a careful study of this part of the subject, I am prepared to maintain the following opinion, viz.: The employed have no chance whatever of gaining any permanent profit by trades unions, except in so far as these may help them in appealing to the sense of justice of their employers. In this regard trades unions have already done some and doubtless will do more good. They have been useful also in training the men to habits of loyalty, of order, obedience and self-sacrifice, and so benefiting their character. Besides this, they afford a method of providing select committees of the more intelligent workmen to confer with the railroad officers or other employers. In case of strikes and so forth, it is certainly pleasanter for employers who wish to confer with their men to meet such of them who can understand and appreciate—perhaps sometimes refute—the employer's arguments concerning profits, interest, talent, business risk, etc., which make their position.

In the writings of Mr. Thomas Brassey, the great English contractor and member of Parliament, upon this subject, he lays great stress upon the principle first mentioned, viz., of conciliatory conferences as the best panacea he can discover for the disagreements of employers and employed. Mr. Brassey is a man whose opinion is rendered valuable by his long and successful experience as employed and employer in large railway and other enterprises, both at home in England and abroad. There can be no doubt that the relations of capital and labor could be rendered much more amicable, on railroads as well as elsewhere, if the officers or employers could make it convenient to confer occasionally with committees of the men upon these topics, explaining to them the business reasons which actuate their policy toward them. It could certainly do no harm either to the officers or to the road, while, from all the data we can collect, it certainly appears to result in a more willing and effective service on the part of the men. The officers of a railroad, as well as other employers, forget that the men frequently maintain a dense ignorance on this subject. When such explanations are not made, as they seldom are in our country, the men are very apt to believe that it is because there *are* no good reasons which could be given.

Mr. Brassey recommends the workmen to select a few of their most intelligent and faithful men to wait upon their employers, if they will receive them, for the purpose not of adverse discussion, but to remove misunderstandings and to learn the arguments which tell on the employers' side of the case. They are prepared, if he or they wish it, then to lay before him or them the arguments which they consider as bearing most strongly in favor of their own side. In this way they can form a better idea as to what concessions will satisfy either party.

In England, the country where the labor question is most pressing, these conferences have done more to solve it than any means yet tried. They have organized regular boards, not only of arbitration, but also boards of "conciliation," consisting of equal numbers of employers and employed, to which are referred all disputed questions. As bearing on this point, you may not dislike to hear the following extract, taken from Mr. Henry Crompton's book called "Industrial Conciliation":

"In an arbitration which took place March 1, 1875, in the Northumberland coal trade, the employers began their case with the following remarkable statement:

"'It is with pleasure that we proceed to draw your attention to one of the most active mining districts in the kingdom, where for many years the masters and the men have been on the most friendly terms. You will find that the miners of this district form, both physically and morally, a most advanced type of mankind, from which some of our most talented and clever inventors and Senators have been drawn, and from which, with great skill and judgment, some of the ablest advocates have been selected that ever represented any body of men. And the owners so far appreciate their intelligence that they meet their representatives at all times, and frankly and cordially discuss with them all matters in dispute.

"'The result has been that the mines have been kept continuously going, and both masters and men have severally reaped the greatest possible advantage that could be obtained.'"

How many of our mine-owners could speak thus of their Molly Maguires?

It would be easy to multiply instances such as this which serve to show the satisfactory direction the question is taking in the country which has most interest in it. We see that the principle of conciliation does work well and is bearing good fruits.

Much has also been done, on many roads, to secure effective service by various measures, which, while they promote the well-being of the employes, also inspire them with a greater interest in the welfare of their road. Such, for instance, as the establishment of permanent tenure of service during good behavior, with regular grades of promotion in rank and in pay.

Or in the system of increase of pay with length of service, and accompanied by pensions to those employés who, after a sufficient term of years as able-bodied men, have become superannuated in the service of the company.

By establishing a uniform for all the employes of the company, and seeking to awaken by this means an *esprit de corps* among them similar to that which obtains among the soldiers of a crack regiment.

Also by the issue of periodical bulletins, which make honorable mention of any meritorious services of the employés; as well as the donation of gratuities for such remarkable conduct as frequently occurs in railroad service.

Some roads have established provident funds of the nature of life insurance companies. These are in some cases made up of the fund resulting from fines for misconduct, together with regular assessments from wages and contributions by the company. In other cases they are regular insurance companies, guaranteed by the railroad company, which can issue regular policies to the employés, not only for the case of death, but also against accident or illness. Some of the French companies go so far as to arrange for physicians' services to their employés in case of sickness, keeping sometimes two or three physicians in the sole employ of the company. They also arrange for their invalid employés to visit some mineral baths or other summer resort, partly at the expense of the company.

They also furnish coal, delivered to employés at wholesale cost prices.

The children of employes are, as a rule, given the preference for situations in the companies' service suitable for young persons.

Many companies adopt the policy of disposing of building sites, along the line of their roads, on favorable terms to employes. These are generally selected with a view to convenient arrangements for transportation. By these and other measures the railway companies are seeking to counteract the influence of trades unions; to prove to their employes that they are their best friends, and to promote, by every means in their power, that feeling as to what is fair between man and man, which must exist in order to insure any lasting agreement.

The second of the methods by which the labor parties seek to abolish poverty is communism, or socialism. The gentlemen demand that all property should be equally divided among the whole community, or they say that the government should hold it in trust for all. That the government should also regulate the hours of labor and the price of it, and should make everybody work at whatever they were best fitted for, so that no one should have to work too much. They believe in free education, free litigation, free suffrage, free church (if any), free money and free love.

This party is entirely theoretical, and relies on being taken up by politics in order to effect anything. It holds conventions sometimes. It has just held one in New York this very month, May, 1878, and another in Philadelphia. These conventions generally believe in blood. Some want to wade in it ankle deep, while others think that knee deep would be better. And yet I think I could prove that every person here was at heart, to a great extent, a communist. For the truth is, that the best of the communist doctrines have already been adopted by nearly all free countries. Our own government has regulated the hours of labor, and those of other countries have often regulated the price by law, but without practical success. We have free thought, free speech, free church, free suffrage, free labor and, as yet, free capital, which is taxed, however, rather heavily. Some of us are disposed to fancy that we have free love also, to a perhaps greater extent than is quite consistent with our present state of culture. As for the other freedoms and divisions of communism, some of them will doubtless be introduced when the time is ripe for them.

Concerning the practice of communism, I have an example to quote for the benefit of our friends of that persuasion who have been holding conventions this month in New York and Philadelphia. It is as follows:

Some two centuries and a half ago, or thereabouts, a small body of people who believed in many of the doctrines now advocated by the communists became dissatisfied with the state of things in their native country. They found themselves oppressed and injured and could get no justice. So they sailed away across the sea and started a new country for themselves. They believed in free church and free conscience, free suffrage and free education for all. They believed that property should be held by the state in trust for all who could pay for it and take care of it, and that these *should be protected*. They believed in a free government *of* the people, *for* the people, and *by* the people. They did not go about seeking to create riots and wade in blood and to divide *other people's* property, but they made their new country a safe refuge for the oppressed of all nations. They were our forefathers, and they made us a country we are all proud of.

Now there is a glorious example for the emulation of our communistic friends. They find themselves oppressed and injured and can get no justice. Why, then, if they have the stuff in them, do they not imitate the brilliant example and go start a new country for themselves? They would have no adverse community to hamper them; they could start everything fresh with a band of congenial spirits. If their principles are correct it would need but a few years to place them at the very pinnacle of civilization. Wealth, beauty and talent would flock to their shores and render them irresistibly attractive. The wilderness would blossom like the rose, and all fair and noble things would there find their highest development. When the experiment had thus been proved triumphantly successful, all the rest of the world would first envy, then imitate them, and communist doctrines, thus demonstrated, would become universally adopted.

Should these gentlemen decide not to try this experiment but to remain quietly with us, it must certainly be because they either do not believe in their own principles, or have not the stuff in them to carry them out. We shall, therefore, be obliged to take care of them—good care. We shall be glad to discuss with them all the questions relating to human progress. But, if the reports prove true which we hear, as to the drilling, and disciplining and arming of large bodies of men in Chicago and other Western cities, and if they should again attempt to further their principles by unlawful violence, it will then become our painful duty to teach them, as mercifully as possible, but at the cannon's mouth, with grape and canister, if need be, OUR PRINCIPLES, viz., that true progress consists with reforming and amending the laws, but NEVER in BREAKING THEM!

The third great agency by which the labor parties propose to abolish poverty is coöperation. This they state is so perfect a scheme that it actually threatens the existence of the whole class of employers. Now, as a mere employer, I will remark that, however undesirable this consummation may now appear to employers in general, still it is undeniable that this principle of coöperation is in many respects a good one, and agrees with the doctrine of conciliation, which we shall find to be the only proper solution of the labor question. It has now been tried for nearly half a century in various countries, sometimes with excellent success. In its perfect form it requires that the laborers in any enterprise should also furnish the capital; as if, for instance, the stockholders of a railroad should undertake to run the road themselves and allow none but stock or bondholders to become employés. Co-operative stores have proved a complete success wherever they have been established to furnish the necessaries of life, such as for instance groceries, clothing, etc. In these stores the stockholders are the consumers as well as being also the employés and capitalists. They purchase the goods for the store, and then sell them again to themselves, and divide the profits among themselves. The success of this system has been so great that many millions of pounds sterling are at present invested in England in these co-operative stores. The employes of the English civil service have successfully introduced them for the supply of all their necessary articles. I have not, however, been able to find any satisfactory data as to co-operative stores for the sale of luxuries.

Many employers in this country have given the employes a percentage of the profits. Co-operative factories have also been to a certain extent successful. It is, however, to be remarked that they have almost invariably ceased, when successful, to be co-operative, and have become simple stock companies.

A very full account of coöperation may be found in Pro-

fessor Fawcett's "Manual of Political Economy." But, while admitting that there are many branches of industry in which co-operation may be organized in a satisfactory manner, we cannot help seeing that the time is yet far distant when it can hope to exercise any very valuable influence in such complicated and extensive enterprises as railroads.

After a careful revision, then, of the three methods proposed by the labor parties for the abolition of poverty, we are led to the irresistible conclusion that neither of the three offers us a satisfactory solution of the labor question.

Neither can the solution be given by the unassisted abstract reasonings of economic sciences. The question is one of human interest, and to a great extent of human feeling. The heart must and will have a say in it, as well as the head or the pocket.

The more you study this question the more you are impressed with the truth of the statement made when speaking of trades unions, and which I will now amplify, viz.: That the lower classes of labor, and the very lowest classes in general, have *nothing to hope for* except from the justice and charity and mercy of the class of employers. The lowest class of all is the criminal class, the people who are morally and intellectually lame and crippled and must be taken care of as mercifully as is consistent with justice. We have hospitals for the care of the physically crippled or injured, but do we exercise enough pity and consideration for those who are morally and intellectually crippled? What will they ever do for themselves but increase their own class? Take the next class above them, the very lowest of the poor, what can they do but increase their own class? No slaves ever abolished slavery since the world has stood. No class of poor people will ever abolish poverty. The help has always come from above, in more senses than one. We *are* our brother's keeper, whether we admit it or not.

The solution of the labor question is therefore to be found in the direction of concillation and *leveling upward*. Raising the lower classes by help from above. Preventing even the formation of a criminal class, as much as possible, by compulsory education and training. For ignorance is answerable for the greater part of the intellectual decrepitude which results in crime. It may not be known to you, that as a matter of fact and statistics, the criminal class is ascertained to be inferior both in mind and body. Of course there are criminals who are exceptionally strong and clever, but as a rule, the inmates of our jails and penitentiaries are not only a people with a want of talent, but also with a want of physical strength and health. For the cure of this evil we require not only free education but *compulsory* education and training. If we could expend half the money now wasted on police and prisons, in the prevention of criminals by means of proper early training, it would be a great step toward the solution of the labor question. If we could have every person who is capable only of manual labor properly employed by some one who would take due care of him, mentally, morally and physically, we should then have completely solved the labor question. And it is what we are coming to.

For the one thing in which all the labor parties are right is in the feeling they dimly express, that they ought to be taken care of by the employer classes. The strong must take care of the weak. Physically they now do so in all civilized countries, but what we have yet to learn and to practice is, that the intellectually strong are bound to take care of the intellectually weak. They are bound to do it in their own interest, as well as for all nobler reasons. At the present moment, the families of the operatives on strike in England are being supported by contributions from the very employers against whom they are striking. Here is an example of the rude beginnings of the working of this principle. The employers, and we are nearly all of us employers in one way or another, must take care of the employed. For this object it is necessary that the whole community should interest itself in the labor question and should earnestly desire a just and satisfactory settlement of it, in the interests of civilization and for the greatest happiness of the greatest number. It is only in this way that social questions of such magnitude can be settled.

It is therefore your duty to give this question a share of your time and study, for surely no men among us are more interested in it or can be more useful in solving it, than those whose daily lives are passed in dealing, both as employers and employed, with the relations of capital and labor. I mean the gentlemen I have the honor to address, the master mechanics of American railroads.

MASTER MECHANICS' ASSOCIATION.

Proceedings of the Eleventh Annual Convention.

SECOND DAY.

The convention was called to order Wednesday morning at 9 o'clock by President Chapman.

A letter from Professor Thurston, of the Stevens Institute of Technology, Hoboken, N. J., was read, expressing regret that he was unable to be present, and notifying the convention that he had sent to them one of the Institute's machines for testing lubricants. Accompanying the letter were the results of several experiments.

Mr. M. N. Forney, of the *Railroad Gazette*, offered the following:

Resolved, That a committee be appointed to confer with the Master Car-Builders' Association, or any other parties, regarding the best form and proportions for a standard car- and tender-axle, and that the committee report to this Association at the next annual convention. Adopted.

Thanks were voted to A. Shaw, Superintendent of the Richmond & Petersburg Railroad, and to the Chesapeake & Ohio Railroad Company for courtesies extended to the convention. Mr. Shaw offered all facilities for an excursion to Petersburg. General Wickham desired to serve the members in any way most agreeable to them.

LOCOMOTIVE-WHEELS AND AXLES.

The report of the committee on "the best form and materials for locomotive-wheels and axles; also the best method of counter-balancing," partly discussed on Tuesday, came up as unfinished business.

This report was published in full in the *Railroad Gazette* last week.

The report, after further discussion by Messrs. Forney, Black, Wells, Woodcock, Rushton, Johann, Hudson, Setchel, Hayes and Sedgely, was referred to a committee, consisting of Messrs. James Sedgely, of the Lake Shore & Michigan Southern; H. L. Cooper, of the Indianapolis, Bloomington & Western, and J. M. Boon, of the Pittsburgh, Fort Wayne & Chicago, to confer with the Master Car-Builders' Association.

Mr. D. A. Wightman, of the Pittsburgh Locomotive Works, was added to the list of members.

REPORT ON LOCOMOTIVE BOILERS.

Mr. R. Wells, of the Jeffersonville, Madison & Indianapolis Railroad submitted the report of the Committee "on Best Materials, Methods, Forms, Proportions of Construction of Locomotive-Boilers, and the Best Method of Promoting Economy in the Use of Fuel."

The committee complain that they have not been able to collect all the data they would like. Over two hundred circulars were sent out and replies only received from twelve persons. In answer to the question, "*Which have you found to be the best material for the shell of the boiler, iron or steel?*" the preference is very decidedly in favor of steel. The committee say: "Those who have used it longest are most decided in their preference for it."

"In regard to the best thickness of metal for the sheets of a boiler from forty-eight to fifty-two inches in diameter to carry a working pressure of one hundred and thirty pounds of steam the opinion was unanimous that in the case of steel three-eighths inch was sufficient and the best thickness to be adopted, taking all things into account, and in the case of good iron from three-eighths to seven-sixteenths was considered the best thickness of metal."

To the question, "*To what extent does a welt on longitudinal seams add to the strength of the boiler?*" but little positive information was elicited by the committee. The practice of constructing boilers on that plan has not yet become general.

To the question, "*Do your boilers deteriorate from the inside in the form of pits, commonly called pitting?*" the committee have received various answers, but no very conclusive reasons are given as the cause. [Here follow syllabuses of the answers.] The general complaint is that they *do* deteriorate. The committee say that the inference is that some cause exists other than defects in the metal of the sheet. Just what the cause is the committee is not prepared to say other than that they believe it to be chemical.

To the question, "*What is the best form of boiler for the ordinary eight-wheel American style of locomotive?*" the committee find that a majority prefer the plain or straight boiler, sometimes called the telescope boiler. "Distortions of every kind," say the committee, "should be avoided in the form of the boiler whenever it is possible to do so, for the reason that the pressure within tends to change the shape or form at such points unless strengthened by stays or braces; therefore the form nearest a plain cylinder will be the strongest, and require least bracing, other things being equal."

"With the use of comparatively pure water, forming no scale of consequence, a dome would, perhaps, be unnecessary where the steam-space above the water was sufficient; yet, as an opening of some kind large enough to permit access to the inside of the boiler is a necessity, such opening, as regards weakening the shell of the boiler at that point, is, perhaps, as objectionable as a dome. If the former can be made so as not to weaken the boiler, there is no reason why the dome cannot be attached in such a way as to be equally as strong at that point by flanging the sheet upward inside the dome and the addition of a ring of suitable proportions riveted to the inside of the boiler at the foot or flange of the dome."

To the question: "*At what point on a straight boiler should the dome be situated to give the best results, all things considered?*" not much difference of opinion is expressed in the answers sent to the committee. "All agree that it should be either directly over the tube-sheet of the fire-box or at some point between that and the middle of the length of the boiler. There seems, however, to be no good reason for locating the centre of the dome any further forward than the tube-sheet in the ordinary eight-wheel locomotives, for the reason that it is desirable to carry as much of the weight of the boiler on the drivers as possible, and also that that point is the most central from the points where steam is generated."

The best material for fire-box sheets? The testimony is unanimous in favor of steel.

This subject is ably and elaborately discussed by the committee.

On the subject of ruptures the committee say:

"Mr. Woodcock, of the Central Railroad Company of New Jersey, mentions one case of a *rupture of a side sheet while the boiler was being filled with warm water*"—the first case of the kind coming to the notice of the committee. After considering Mr. Woodcock's account of this novel occurrence the committee submit the following explanation:

"The sheets of the fire-box and the mud-ring having cooled off to about the temperature of the surrounding atmosphere, when water at a considerably higher temperature than the mud-ring was allowed to fill the water-space, and as it rose upward along the sheet, the latter, being thin, soon became of the temperature of the water in contact with it, and expanded in proportion to its temperature, while the much larger body of metal remained comparatively cold, and, being cold, would be shorter than on the line which had become warm from the water in contact."

Mr. Wells, chairman of the committee, by the use of the blackboard and diagrams, made this case a very interesting one, and explained it fully and finely. The above is but an outline of the explanation.

As a *remedy for ruptures*, corrugations or channels in the sheets at points liable to such strains are recommended.

The cost of repairs of boilers, the committee report, is very largely influenced by the character of the water used in them; and the committee believe "that it would be economy in the end to spend comparatively large sums of money in many instances in order to procure water that is free from ingredients forming these injurious and objectionable deposits."

The hour of 12 o'clock having arrived, Mr. Wells yielded the floor to the order of the day, "The Treatment of Locomotive Boilers." This was discussed by Messrs. J. H. Setchel, James Sedgely, J. M. Boon, William Rushton, W. S. Hudson and W. Woodcock.

In relation to cleaning out boilers the drift of sentiment seemed to be against blowing off, and in favor of allowing the boilers to cool down and then to wash them out with warm water from hose.

The discussion was still going on at 1 p. m., when, according to the order, the report on locomotives was again taken up, and Mr. Wells concluded its reading.

On the subject of the *best proportions of boiler to cylinders of a given area* to furnish steam with the least consumption of fuel the committee have received so little data that no positive facts can be deduced therefrom.

The committee submitted an interesting paper from C. M. Higginson, of the Chicago, Burlington & Quincy Railroad, on the subject of combustion of coal in the locomotive, giving the results of a large number of tests.

The report was referred to the Advisory Committee, with the power to print the report and such of the accompanying papers (there were several of them) as they may think proper.

The report was then discussed by Messrs. Hayes, Rushton, Forney, Setchel, Hudson, Woodcock, Boon, Sedgley, Wells, and others.

On the subject of pitting, the opinion was unanimous that the cause of it is chemical action. Some thought iron less affected by it than steel; others, that steel was far less affected than iron. A variety of theories were advanced as to tests, etc.

The convention took a recess from 2 to 3½ o'clock.

The form of boilers, the advantages and disadvantages of locating the dome over the fire-box, proportion of boiler to cylinder, and other matters embraced in Mr. Wells' report, were discussed by Messrs. Hayes, Wells, Sedgley, Hudson, Rushton, Johann, Forney and others.

LONG RUNS.

The report of the Committee on Long Runs of Engines was not ready when called.

DECEASED MEMBERS.

Mr. Johann announced the death of A. J. Hanglin, of the Texas Pacific. It was ordered that a special committee be appointed to prepare suitable resolutions in respect to his memory. Messrs. Johann, King and Devine were appointed on the committee by President Chapman.

A eulogy upon the character of the late Edwin Garfield, of Connecticut written by Mr. Gordon H. Nott, was read by the Secretary. Ordered to be spread upon the minutes and printed in the report.

The President appointed Messrs. Woodcock, Eckford and Boyden a committee of three to present names to be voted for as next place of meeting.

Adjourned until 9 o'clock Thursday morning.

Contributions.

The Hard Lot of Train-men.

CHICAGO, May 8, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice in your valuable paper, under date of May 3, an article on the subject of "Education of Railroad Men," and in the same article you refer the reader back to a former number, in which there is an article on the same subject, and in the latter number you speak of the subject as being "written about previous to the Centennial Exhibition."

I have been a subscriber to your valuable paper but a short time; hence my not knowing that any one had ever thought of this great and glorious good work but myself. I have spoken to two different superintendents on the subject of *educated railroad men*, and why it is they cannot see that it is to their interest to have educated men in their employ is a question I am not able to solve. If a corporation will, by such demonstration, let their men know that they think something of them, the men will reciprocate their love by uncomplaining labor. If schools or literary societies were placed at the disposal of railroad men, and they were led to believe that it was to their interest to keep them up by attending, and not only attending but by taking part in the exercises, it would have a tendency to instil into their minds that they were somebody, that they had something to live for, something to work for; it would give them something to think about besides their hard lot. And, besides, if your railroad men are *educated* they are more capable of taking into consideration that great word, that *vital* word to all railroad companies, "strike." While an educated man knows that he has the right to work for what is offered or quit, an uneducated man knows only enough to go with the crowd.

There is one class of railroad men that must not be ignored. They need not be petted, but they had ought to be respected, viz., train-men. They certainly are the *bone and sinew* of any railroad company. Without them you can do nothing; with them, everything. Then it certainly is important to keep them in good humor, and they are not so hard to satisfy as one might suppose. I am running on one of the great roads leading out of Chicago. I am a brakeman on a freight train (supposing the case). I sleep in an old caboose from one year's end to the other. An old bench for a bed, my overcoat for a pillow (if I am fortunate enough to have one). This constitutes my bed. I arrive in Chicago say 5 a. m. I look at the bulletin board, and see that I am to go out at 6 p. m. How much sleep am I going to get to-day, being "*pumped up*" all day by a switch engine? Supposing I am a married man, I live at least a mile from the depot or freight yard. The time consumed in going to and from home lessens my time for sleep so much that when I come to go out I am in a very good frame of mind to strike, if the opportunity offered. Being a modern railroad man, I curse the train-master, the superintendent, and in fact every one that I think has it in his power to alleviate my distress. Hence the necessity of giving train-men ample rest, for the officers not only get cursed, but the men are not fit for duty. A thousand dollars would fit up sleeping apartments for train-men, with bath-tubs, etc., which would be the best invested thousand dollars the company ever made. What is the use of schools if men haven't time to attend? Just the other day one of our conductors told me he hadn't seen the division by *daylight* for two months, and he had been over it once every night in that time.

It was not only so in his case, but all of the men were running the same way. They get no time to see their families, to say nothing about going to school, and they are expected to be as vigilant when running this way as when they have twenty-four hours' rest at the end of each trip. However, too much rest is as detrimental as not enough; but it had better be the latter than the former.

While I am thankful to you for the interest you manifest in this branch of railroading, I would like to hear the opinion of some one situated like myself. B. P

Copyrights or Blanks for Car-Reporting—The "Daily Individual Report."

CLEVELAND, O., May 21, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As it appears to be a difficult matter to have my claim on the "Daily Individual Car Report" fully understood, I beg the use of your columns to state that the copyright that I hold applies to the form of sheet on which the record is kept in the home office, it forming a continuous record sheet. The copyright has no connection whatever with the "Daily Individual Report." The blanks used for this purpose are *free as air*, as far as I am concerned.

I hope the above will satisfy all parties that I will not become a millionaire or bring any suit against those who adopt the "Daily Individual Report." A. W. DAVIES,

Car Accountant Atlantic & Great Western Railroad.

RAILROAD GAZETTE

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S. WRIGHT DUNNING AND M. N. FORNEY.

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

THE MASTER MECHANICS' MEETING AT RICHMOND.

It must be confessed that the opening of the convention this year was rather depressing. From the brief notice of the first day's proceedings which was published last week, it may be seen that only twenty-seven members answered to the roll call. Nine new members then signed the constitution, so that there was an attendance of thirty-six at the opening.

The hotel selected for headquarters was the Ballard and Exchange. To those not acquainted in Richmond, it should perhaps be explained that this hotel, as its name indicates, consists in reality of two buildings, which are situated opposite each other on the same street, and were at one time kept as separate and competing houses. Early in their history it was revealed, however, that such competition was destructive to both, and as it so often occurs in the history of competing railroads, it soon became apparent to each that the only way that either could survive was to consolidate the two. The result was that years ago the two were united under one management, and connected by a covered bridge which provides easy access across the street from one house to the other. There are, therefore, two buildings, each connected with all the necessary apartments for a complete hotel. There is a large dining room for each, but only one of them, that in the Exchange, is used. The other in the Ballard House was therefore available for holding the meetings. It is located off from the street, and as the main business of the hotel is conducted in the other house the room was perfectly quiet, which is so important a matter at such times that nearly all other considerations become comparatively unimportant. The room was, however, much too large for the number of members present, and on the opening day there was a cold northeast rain storm of the most dismal character. There was no stove in the room, so that nearly all present were, even with their overcoats on, chilled through during the session. Besides this, the building being in more or less disuse there was a pervading feeling about it of stagnant air and a depressing array of empty bottles and boxes of all kinds and sizes stored away in the halls and adjoining apartments. The dining room is not well lighted and the platform for the presiding officers was placed at the end of the room with the windows from which the main light entered immediately behind them. The result was that the audience in front were almost blinded, and while the rotund figure of the Chairman and the attenuated form of the First Vice-President appeared in *silhouette*, not a single feature of their agreeable countenances was visible. The preliminary and routine business was transacted and listened to with Spartan courage, but with hardly a gleam of animation from any one.

We speak of these things to show, as has been pointed out before in these pages, how much the success of a meeting of this kind is dependent upon the mere mechanical incidents of its assembling. Probably nothing could be done which would increase the usefulness of conventions of this kind so much as a small manual of directions for "making arrangements." There are elaborate treatises on the rules of order, etc., but there is no instruction anywhere for committees of arrangements.

On the second day of the meeting, however, a stove was provided, and there were new accessions of members, so as to increase the number to over fifty, and then, both literally and figuratively, it may be said that those present warmed up, and the reports and discussions excited much interest.

Mr. Wells gave an excellent report on boiler construction, a brief abstract of which appears in the report of the second day's proceedings elsewhere, but which will be published in full hereafter in these pages. It showed that a great deal of labor and time had been expended on it. The effect of the reports and discussions on this subject is perceptible in the increased interest which is taken in it. A few years ago it was almost impossible to induce the members to discuss the details of boiler construction. It somehow seemed to be assumed that the arrangement of rivets and braces always came right by some inscrutable principle of the survival of the fittest, which is perhaps true in a certain broad sense. At the Richmond meeting, the proportions of riveted joints, the strength of braces, the weakening of the shell at the base of the dome, and other kindred topics were discussed so as to show that members had been giving these subjects much attention. It certainly is a matter which is very deserving of attention.

The report on Locomotive Tests consisted chiefly of sub-reports submitted to the committee from members at its solicitation. The most valuable one of these comes from Mr. Martin, of Chili, South America, who, it will be remembered, submitted some carefully made experiments to the same committee last year. There seems to be an almost incomprehensible amount of indifference on this subject on our American railroads, which it is very hard to understand. At the present time there is hardly a road in the country which is not obliged to use every effort which promises in any way to reduce the cost of operating its lines. In many cases it is an actual struggle for existence, and, in nearly all, the question of dividends now depends upon the amount of reduction which can be made in the expenses, of which the cost of fuel averages about six per cent. There are few roads on which a reduction of one-half to one per cent. in the total expenses could not be effected simply by improving the working of the locomotives and establishing a strict accountability for the consumption of fuel. This, too, by incurring very little other expense than that which is necessary for the ordinary repair of the engines. This statement is made after years of careful observation and with due reflection. Besides the reduction in the consumption of fuel on the roads having a heavy freight traffic, a very great economy may be effected by *increasing* the capacity of the engines. The cost of wages alone of enginemen and firemen, as has often been pointed out in these pages, is about equal to the cost of fuel on most roads, being of course more when fuel is cheap, and less when it is dear. If, then, the engines can be improved so as to draw heavier trains, as much saving will be effected by a proportional increase of their capacity as by an equal proportional reduction of the consumption of fuel. Thus, if the consumption of fuel of one engine is reduced ten per cent., and the capacity of another is increased ten per cent., with the same consumption of fuel, then if the cost of fuel is equal to that of the wages of the locomotive runner and fireman, the economy is the same in both cases, because in the one case the expenditure for fuel is diminished ten per cent., and in the other case the expenditure of an equal amount in wages produces ten per cent. more work or value.

At first it seems hard to understand why there should be so much indifference to this subject, especially at a time when all other expenses are guarded so jealously. It is due, we believe, to the fact that the authority over such matters is now so generally in the hands of persons who are comparatively ignorant of them, both in theory and practice. While it is believed that a man cannot practice law or medicine without studying those professions, nor work at the trade of a shoemaker or operate a telegraph without learning the trade, it is assumed that special training is quite unnecessary in directing the management of the locomotive department of a railroad, and the impression has grown of late years that a person who is neither a mechanic nor an engineer, and is ignorant, both practically and theoretically, of the construction and operation of locomotives, may yet be qualified to control the machinery of a railroad. In other words, that no special training is needed for such positions. That a man may have special training and be a poor manager is of course true, but it is equally true that he cannot conduct such a department properly without special training and experience for such duties. Even the impression exists that practical and theoretical knowledge as a locomotive mechanical engineer *unfits* a man for the duties of a locomotive superintendent, which is like assuming that hospital practice and the study of anatomy made a man less reliable as a doctor than he would be without such knowledge.

During the session of the convention there was a good deal of discussion about the future prospects and usefulness of the Association. As has been stated, the opening was discouraging, and although the subsequent meetings were better than the first, the attendance was small and altogether it was felt that it was perhaps the least successful of all the meetings which have thus far been held. Richmond, although it is an attractive place when once reached, is not central nor easily accessible for most of the members. This, doubtless, more than any other cause, kept members away. Still it was felt that some active measures should be taken to increase the usefulness of the Association and to induce those who may be benefited by its deliberations to attend. It is for this reason that we have taken occasion to point out somewhat explicitly a direction in which the Association may be practically useful in diminishing the expenses of railroads. If railroad managers realized fully what such an association might accomplish, there would be no question about its continued prosperity, although this we believe is assured with even ordinary good management. If the Association will do the work which it should and can do, it will be the means of indicating methods by which there may be a direct saving of money in the locomotive expenses.

Such results must, however, be attained by the intelligent coöperation of the best men. There are unfortunately some of the ablest master mechanics in the country who still hold aloof, we believe for reasons which are to a considerable extent misapprehensions. That the Association is all that it should be, or all that its friends would like it to be, is of course not true. No association ever is. If such men as Mr. Ely, of the Pennsylvania road, Mr. de Funiak, of the Louisville & Nashville, Mr. Buchanan, of the Hudson River, Mr. Wallis, of the Grand Trunk, and Mr. Chanute, of the Erie, could be induced to come in and take part in the deliberations, they would be able to fashion the Association into the shape which we believe that they think it should have. There are ruts and practices into which those inside the meetings and those outside of them have fallen which would require but a slight effort to reform out of existence.

An association of this kind, if it is not advancing, is sure to retrograde, and although it is now very securely established, it cannot have a healthy existence on its past reputation alone. Those who have been connected with it know that its doors and its books are always open to all who choose to come in. This is perhaps not so well understood by those who are outside as by those who are in. It therefore seems desirable during the present year and before the next annual meeting, to make some distinct effort to induce many who are not members to become such.

The Progress of Consolidation.

The Keokuk & Des Moines Railroad, it is announced, has been leased by the Chicago, Rock Island & Pacific Company. This is the old Des Moines Valley Railroad, extending up the Des Moines River from the Mississippi at Keokuk northwest by west to Des Moines, 162 miles. It never was a very profitable property, but in the days of the railroad-building fever its owners thought to better it by constructing an extension from

Des Moines nearly due north to Fort Dodge, 88 miles. Like other north-and-south roads in Iowa it fared hard, and in 1873, three years after this extension had been opened, the road was sold to satisfy the mortgages. One of the latter was a lien only on the extension, and as the bondholders under the different mortgages did not agree, the two sections were sold separately, and the purchasing bondholders organized two companies, the Des Moines & Fort Dodge Company taking the extension, and the Keokuk & Des Moines Company the old road. The latter was organized with a comparatively light funded debt of $75,764 per mile, making the total yearly interest charge about $181,500. But the business of the road is light, the gross and net earnings since the reorganization having been :

	Gross earnings		Net earnings	
	Total.	Per mile.	Total.	Per mile.
1874	$706,186	$4,353	$254,781	$1,570
1875	792,783	4,950	257,325	1,586
1876	602,902	3,723	137,306	846

The figures for 1877 have not yet been reported; there are figures for the year including the first three months of 1877, showing $581,990 gross and $170,442 net earnings. The road is unique in the Iowa system, being neither an east and west nor a north and south road, but a diagonal line extending from the extreme southwest corner of the state to its centre, really in a favorable direction to carry traffic to and from the East, but unfortunately for itself in an unfavorable position to carry to and from Chicago, which is the great market for nearly all Iowa. It is, too, just where new Iowa railroads are the thickest. Thirty miles from Keokuk it crosses the Burlington & Southwestern, 34 miles further the Southwestern Division of the Chicago, Rock Island & Pacific, 12 miles further the Chicago, Burlington & Quincy and the St. Louis, Kansas City & Northern, 15 miles further the Central of Iowa, 9 miles further the Oskaloosa Branch of the Rock Island road, while at Des Moines it reaches the main line of the last-named road. And nearly all these roads cross it at an acute angle, so that it has a competitor within a few miles for almost its whole length.

The tendency of the traffic of the country on its line to go to Chicago makes it difficult to utilize the whole of this road to advantage. That is, if the freight takes the shortest route, it tends to leave this road at the first junction with a Chicago road. There is a line to Chicago from Keokuk, but it is 250 miles long, and from Des Moines to Chicago by this route is 412 miles, against 357 by the Rock Island road. In connection with the Rock Island's branches, the freight between Des Moines and Oskaloosa, 62 miles, can be sent from Oskaloosa to Chicago, 311 miles, and that between Oskaloosa and Eldon, 36 miles, or between Des Moines and Eldon, 98 miles, from Eldon to Chicago, 304 miles. Then, to do the business from Keokuk to Eldon, 64 miles, over the Rock Island to Chicago, will require an awkward circuit, making the distance from Keokuk to Chicago 368 miles, instead of 250 by the Chicago, Burlington & Quincy. Thus, the part of the road from Eldon to Des Moines fits into the Rock Island's system quite neatly ; the rest of it, not at all well. However, if the traffic of the road must go to Chicago, which to a great extent it insists upon doing, the connection with the Rock Island road is perhaps as favorable as any, with the possible exception of one with the Chicago, Burlington & Quincy. The latter gives an outlet about the same length as the Rock Island for the 100 miles southwest of Des Moines, and a shorter one for the rest of the road, and we believe that the Chicago business of the Keokuk & Des Moines has heretofore been done chiefly over the Chicago, Burlington & Quincy, and there has been some talk of a union with it. The chief objection to this would be that with such a line the Burlington company would be invading the Rock Island's territory; for the latter company has apparently made preparations to occupy the country to the south of it, as far as the Burlington road, which is generally 30 or 40 miles distant. It has now in operation about 100 miles of a parallel line (in two sections) about half way between these two through lines, besides the Southwestern Division, which crosses this district diagonally. The Chicago, Burlington & Quincy, on the other hand, with one exception has confined its branches to the territory south of its line, where it has several. This one exception is a line parallel with the Keokuk & Des Moines road extending from Albia, 25 miles west of the crossing of the last-named road, northwestward 33 miles to Knoxville, which is about 50 miles southwest of Des Moines. It is probable that the possibility of the Keokuk & Des Moines falling into the hands of the Chicago, Burlington & Quincy has influenced the Rock Island company in making the lease. The road could be worked by one of these great companies more advantageously than as an independent line, it was not likely to be of any great positive advantage to either, but in the hands of the Burlington company might be made to injure the Rock Island somewhat. Of course, the possession of it also enables the Rock Island to invade the Burlington company's territory, but it is not true that the command of it by the Rock Island can be made as disadvantageous to the Burlington as the command of it by the Burlington could have been made to the Rock Island, for the reason that in most of the district where the Burlington has lines which may compete with the Keokuk & Des Moines, the route by the Rock Island will be the longest, and in places much the longest.

The most natural connection of this road, if its traffic could be made to go through to the East without the intervention of the Chicago market, would be the Toledo, Peoria & Warsaw road, extending directly eastward from Keokuk. This connection may possibly be of some use to the Rock Island road, though hardly for through business to and from the East; perhaps the cutting off of such a connection from the Keokuk & Des Moines will be of more value than the establishment of it with the Rock Island.

The latter will also secure through this line a new St. Louis connection for the western part of its main line, but not more advantageous than the old ones, unless by giving the Rock Island a larger part of the haul over its own road.

Of course it will be impossible to estimate the advantages of the leased line to the lessee until the terms of the lease are known, and these have not been published yet. We can only estimate what the lessee will obtain by its new line, not whether it will gain more than it will have to pay. It is, however, probable that the Rock Island can pay all that the independent company could earn with its road and still have something left for profit, besides the protection from competition and the avoidance of occasion for conflict with other great companies by the control of a line largely within its own territory ; and this latter is an object of no little importance, though its importance is very likely to be overlooked by those who consider only the present generally harmonious condition of the relations of this company with its neighbors. We know that there is always a possibility of a conflict when two or more companies compete for the traffic of the same district ; and the greater the number of points of contact, the greater the risk of conflict. The dangers would be almost wholly removed if each company's system occupied a district by itself, which is almost never practicable ; but if the systems come in contact only or chiefly at their borders, the dangers will be much less than if they interlace each other, and virtually occupy the same territory.

This lease and the rceent purchases made by the Chicago, Milwaukee & St. Paul illustrate a tendency, which we have heretofore noted and approved, toward the absorption of the small and weak companies by the large and strong ones. The bankrupt roads are gradually falling into the hands which can make the best use of them. It is not always true, of course, that the leases and purchases are wisely made, or that the harmony of systems is not sometimes disturbed rather than insured by such a change of control. But the general tendency is in the right direction. Many of the roads now bankrupt should never have been built. They cannot be made to produce any return at all adequate to the capital invested in them. But here they are, and they will remain. The question now is to make the best use of them. For some years the strong and solvent companies seemed afraid to have anything to do with them—to take them at any price. This disposition was doubtless encouraged and largely justified by the ignorance of the owners of the bankrupt roads of the true value, or rather want of value, of their property. But stockholders and managers of solvent properties now seem to appreciate the fact that a road which failed disastrously because it could not earn interest on $30,000 per mile may after all be a desirable purchase at $15,000 ; and at the same time, perhaps, by the purchase of the bankrupt road some addition to the earnings or reduction of expenses of the old road may be made possible.

Transportation Legislation in New York.

The New York Legislature adjourned last week without taking any action on any important transportation question, except by passing the free pipe-line bill. Several subjects were proposed, but most of them did not come to a vote, so that it cannot even be judged what the current of opinion in the Legislature was. Among these was the bill to establish a board of railroad commissioners, which might have been a good thing to do and might not, according to circumstances. The general opinion of capitalists probably is (founded to some extent by the State's experience with its Insurance Commission) that it would be bad. The joint resolution for a committee to investigate the complaints as to discriminations against New York passed the lower but not the upper house; and the failure to have an investigation, it seems to us, is to be regretted by the railroad companies at least as much as by the merchants and others of New York. A searching investigation into *all* the different expenses which attach to produce and merchandise received at and shipped from New York, as compared with those on receipts and shipments at the other seaports, would have been, to say the least, very interesting, and might have drawn the attention of the community to practices and customs which affect business at New York much more than railroad rates, and which other cities have reformed, or which, having to struggle hard for their trade and avoid all unnecessary expenditures in order to get any business, they have never been able to establish. A report was made on the anthracite coal combination, which regarded the matter as not particularly harmful to New York, and at all events not easily to be controlled by action of the Legislature. A strong effort was made by some of the farmers who produced milk for the consumption of the city of New York to secure the passage of the bill limiting the charges on milk, and making the maximum considerably lower than the rate charged on some roads. This bill passed the House, but failed in the Senate. Milk is a source of large income to several roads about New York, but more to lines in New Jersey than to those in New York, probably; and as usually the milk farmer can have resort to but one line, the rates have probably always been kept profitable, however low other rates may have been made. It is a traffic, however, which has to be specially provided for, and unless it is very large may well be unprofitable even at high rates. The milk must be brought in at passenger speed, and at an unearthly hour in the morning when passengers will not use the train, and there can be no load back except empty cans. Usually, however, farmers have not complained of rates, except when a line from some rival milk district was carrying for less than they had to pay. That is, what the milk farmers of any given district want is not so much low rates for themselves as the assurance that other districts which supply the city will not have lower rates, and that more distant districts, or districts hitherto inaccessible, will not have as low rates.

The demand for a *pro rata* freight law, that is, a law forbidding charges for local freight higher in proportion than those for through, was not heard at this late session, or at least it was not loud enough to make much of an echo. This demand, coming from the country districts, has been made at almost every session for years. The appearance now of New York city interests claiming a still greater reduction than heretofore in through freights is likely to offset this demand for a *pro rata* law. At least the demands are entirely inconsistent with each other.

No important legislation concerning the canals was had ; there is a movement to abolish the restriction of the expenditure of repairs to the earnings of the previous year and to make the canal virtually free, but it does not seem to be very popular as yet, possibly because the people off the line of the canal object to paying, through taxation, part of the cost of carriage for people on the line of the canal and particularly in the Northwest, the latter being the chief users of the canal. No one seems to have proposed any radical improvement of the canal, as by enlargement, unless the project for a railroad on the tow-path may be called such. This latter project, by the way, seems to have vanished into thin air before any one had a chance to make up his mind whether it was made in good earnest. The chief advantage of the canal now is to the two cities of New York and Buffalo, though all the thickly peopled country on the line from Albany to Buffalo is assured very low rates by the canal even when it does not use it. But there would have been no particular use for Buffalo but for the canal, and as New York's supremacy was originally attained by it so it is to some extent maintained by it. Not that, now they have been established, the canal supports them, but that it is still important to them. Considering the near approach of the time for the completion of the enlarged Welland Canal, whose whole tendency will be to take traffic from the Erie Canal, it seems a little remarkable that there have been of late fewer projects even than usual for the improvement of the Erie Canal. The fact that the latter is 350 miles and the former but about 25 miles long may have led to the conclusion that an improved Erie even would be no match for lake and river transportation, which is what the Canadian route will substantially be when once the way is open from Lake Erie to Lake Ontario.

But if we go on to enumerate all the things which the Legislature did not do and speculate on the reasons for the omission, evidently we may continue indefinitely. Generally we may say that this Legislature has been negatively good. It can hardly be charged with any serious sins of commission in transportation legislation, and hardly credited with any good deeds committed.

East-Bound Rates and Traffic.

East-bound rates have been agreed upon, and there is supposed to be peace again. There is an important change in the rates which went into effect the 1st of April, and which were maintained 16 or 17 days before the "cutting" began, or at least before it became general. This change is a reduction from 25 to 20 cents per 100 lbs. on grain in bulk, flour, boxed meats, and pork, beef, lard, etc., in barrels or tierces; from 35 to 25 cents on bulk meats, and from 30 to 25 cents on fourth-class freight from Chicago to New York. This is a reduction of 20 per cent. on the largest part of the freight, and gives the lowest rate, we believe, that ever was deliberately agreed upon by the railroad companies. A vast deal of freight has been carried at that rate, and for less, within the past two years, but always in consequence of some railroad war. Now, the companies have deliberately concluded and agreed to accept this rate. It is extremely

doubtful if there is any profit in carrying at this rate, but some of the companies will probably prefer to carry without profit rather than permit pretty much all the grain to go by lake. In the latter case New York or New York and Montreal would monopolize the export trade in grain, and the Baltimore and Philadelphia grain merchants would find their occupation gone until navigation closed, which, after having established so important a business, the railroads to those places will not permit if they can help it without actual sacrifices. The lower the rail rates, the better the chance for the markets which receive only by rail. But the reduction, it is seen, extends to provisions as well as to grain, and it does not seem that this could be necessary. When the differences have been greatest, as last summer, the vessels have got but a small proportion of this freight. Of the total hog products shipped from Chicago last summer (some part of which went to the lumber regions and elsewhere for local supplies), less than 8 per cent. in May, 14 per cent. in June, 15 per cent. in July, 15 per cent. in August, 9 per cent. in September, 3 per cent. in October and 9½ per cent. in November went by lake. This certainly was not a formidable diversion, and rail rates then were never less than 30 cents. per 100 lbs. And the shipments by lake were chiefly confined to barrelled pork and lard; of the cured meats not barrelled, which form more than two-thirds of the whole pork product, not more than 3½ per cent. going by lake in any one month, and less than 2 per cent. during the whole season of navigation.

Whether the new agreed rates are maintained or not we do not hear, but there certainly can be little temptation to cut them. It is notable that all through the recent troubles the railroads continued to make their reports of traffic to Mr. Guilford, the Western Commissioner, and these reports become all the more valuable because of the cutting, as they show precisely the effect of the reductions in rates on the different roads and on the total rail shipments as well. There is no doubt that the shipments by rail were materially increased, and perhaps the gross earnings; as to net earnings, the less said the better. If a company makes a profit of five cents per hundred from a 25-cent rate and gets a thousand tons a day, how much does it gain by doubling its traffic under the operation of an 18 (or 15) cent rate? The problem is something like that, and it is shrewdly suspected that the result will be found on the debtor side of the profit and loss account.

The advance in rail rates has not been followed by an advance in water rates, which, on the contrary, are now lower than ever before, corn paying 1¾ cents per bushel from Chicago to Buffalo, and 4¾ from Buffalo to New York. Whether a rail rate of 11.2 cents through, or to Baltimore 9½ cents, will be able to divert much of the grain from the lake and canal, under these circumstances, remains to be seen. But whether the railroads carry grain or not, it seems pretty well established that they will not make any profit from it this season, until after the new crop begins to come forward. Last year, we know, they made money on grain in the fall, being able to advance rates to 35 cents about the 1st of September and to 40 cents about the middle of October, and still getting a very heavy grain traffic. The prospect this year can hardly be considered so good. There is promise of as heavy or even heavier harvests, but there is no prospect of so pressing a demand. Last year, when our crops were harvested the world's granaries were nearly empty, and it was a necessity that the grain should be hurried forward. This year there will be a considerable surplus of the old crop left over, probably, and consumers will not be so pressing in their demands, but will be more inclined to wait for low freights than to tax the capacities of the railroads and vessels at high rates. It will, however, be better to harvest our grain before we market it, and several things may happen before September to upset our calculations.

THE PETROLEUM MOVEMENT has been much lighter this year than last, but after all the exports have been larger than for any year previous to 1877, the total exports in gallons from Jan. 1 to May 11 having been for five years:

1878.	1877.	1876.	1875.	1874.
76,623,252	87,252,268	72,024,491	60,542,620	71,176,609

Before 1874 the exports had never reached 60,000,000 for this period.

The distribution of the exports from the different ports is a matter of considerable interest, as it is now supposed to be substantially regulated by the contract of the Standard Oil Company with the railroad companies. Last year, it will be remembered, the proportion exported from New York increased enormously, largely at the expense of Philadelphia. This was chiefly due to a contest between the Standard Oil Company and the Pennsylvania Railroad, by which the former, controlling most of the petroleum to be shipped, refused to send anything over that railroad. That conflict broke out just about a year ago and lasted six months. Thus the part of the years for which the above figures are given was uninfluenced by this contest. Now the chief difference in the *proportions* of exports for the past two years from different places is in that of Baltimore. New York exported 71.3 per cent. of the total both years; Philadelphia, 15.2 per cent. last year and 13.8 per cent. this; Baltimore, 9.8 per cent. last year and 13.4 per cent. this. New York has never, or at least not for several years, exported a larger proportion than this year; Philadelphia, on the other hand, has never exported a smaller proportion (28 per cent. in 1876 and 17.2 in 1875); Baltimore, in spite of its increase, has not this year reached the proportion which it reached in 1876 (16.7 per cent). So far this year the reports show that 71.3 per cent. of the whole has gone by way of New York, 13.9 by Philadelphia, 13.4 by Baltimore, and 1.4 by Boston.

THE CINCINNATI SOUTHERN RAILWAY TRUSTEES advertise for proposals for completing and leasing this road, having obtained authority from the Legislature so to do, since the failure to secure a vote of $2,000,000 from Cincinnati, and to submit the contract which they may recommend to a vote of the people of Cincinnati. Proposals will be received until July 18, but, of course, it cannot be certain that any of them, however favorable, will be accepted, though the opinion prevails in Cincinnati that this time the city will vote what is needed to complete the road. Very full information as to the condition of the work and what remains to be done may be had on application to the trustees.

THE RAILROAD ACCIDENT INVESTIGATION BILL, introduced into Congress after the Ashtabula accident last year, and reintroduced this year, seems fated to be left to the very last days of the session before getting a hearing, if it does so at all. Last year it did not reach a vote—not even a report, we believe; this year the House Committee only last Friday agreed to report it favorably; but in the hurry of the close of the session it is doubtful if it reaches a vote. If it does it will probably pass; and we believe that it is desirable that it should pass.

Convention of the American Society of Civil Engineers.

The Tenth Annual Convention of the Society will be held at Boston, beginning Tuesday, June 18, 1878.

Sessions for the consideration of professional subjects, and one for the transaction of business will be held.

The meetings of the convention will be held in the Hall of the Massachusetts Institute of Technology, on Boylston street, which has been kindly placed at the disposal of the Society for this purpose.

The first session of the convention will be at 10 a. m., Tuesday, June 18, and for that and the following days the following general programme is proposed:

TUESDAY, June 18.—Sessions at 10 a. m. and 7½ p. m. During the afternoon, by invitation of the Boston Society of Civil Engineers, an excursion will be made by rail to Newton Upper Falls (Aqueduct Bridge, Boston Water Works), thence returning to the city *via* the Chestnut Hill Reservoir and suburbs of Boston.

WEDNESDAY, June 19.—Sessions at 10 a. m. and at 7½ p. m. Such portion of the evening session as may be determined upon to be for the transaction of business. During the afternoon several excursions to places of interest about the city of Boston will be made. Each of these excursions will be in charge of a member of the local committee, and visitors will elect which one to join.

THURSDAY, June 20.—By invitation of the Boston Board of Trade, an examination of the upper harbor of Boston and its improvements, and an excursion down the harbor. Convention dinner in the evening at the Hotel Brunswick.

FRIDAY, June 21.—By train to Lowell, and examination of the works of interest there. Thence to Lawrence, and, after visiting that city, return to Boston.

SATURDAY, June 22.—It is expected that an excursion will be arranged either to the Incline Plane Railroad at Mount Washington, or to the Hoosac Tunnel.

The following is a list of topics to be considered with reference to papers published in *Transactions* during the preceding year.

BRIDGES.

CXL. Approximate determination of stresses in the Eye-Bar Head. William H. Burr.

CXLIV and CXLIX. Relative quantities of material in bridges of different kinds, of various heights. Charles E. Emery.

CXLVII. Proportion of Eye-Bar Heads and Pins as determined by experiment. C. Shaler Smith.

BOILERS.

CXLI. Connected-Arc Marine Boilers, a demonstration of the principles of their construction. Charles E. Emery.

—— Discussions on above paper. J. Foster Flagg. Vol. VI., page 294.

CEMENTS.

CLII. Notes and Experiments on the use and testing of Portland Cement. William W. Maclay.

DAMS.

CXLVIII. Wing Dams in the Mississippi above the Falls of St. Anthony. Edward P. North.

HYDRAULICS.

CXXXIX. The Consumption and Waste of Water Delivered by Public Works. James H. Harlow.

CXLV. The flow of water in open channels. Theodore G. Ellis.

CLIV. A peculiar case of failure in a water main. D. McN. Stauffer.

—— Discussion on above paper. Vol. VII., page 15.

MASONRY.

CLI. Nomenclature of building stones and stone masonry. J. James R. Croes, William E. Merrill and Edgar B. Van Winkle.

MINES AND BLASTING.

CXLII. On the simultaneous ignition of thousands of mines and the most advantageous grouping of fuses. Julius H. Striedinger.

CLIII. On igniting blasts by means of electricity. Julius H. Striedenger.

PRESERVATION OF TIMBER.

—— Discussion on this subject. Vol. VI., page 189.

RIVERS AND HARBORS.

CXLIII. Improvement of Entrance to Galveston Harbor. Charles W. Howell.

CLV. The Improvement of the South Boston Flats. Edward S. Philbrick.

—— Discussion on Levees as a system for reclaiming low lands. J. Foster Flagg. Vol. VI., page 305.

SURVEYS.

CXXXVIII. Coördinate Surveying. Henry F. Walling.

CXVI. A novel railroad survey. Thomas S. Hardee.

CL. Description of survey for determining the slope of water surface in the Erie Canal. William H. Searles.

In addition to the above papers, it is expected that the following subjects will be presented by papers printed previous to the date of the Convention, or read at its meeting:

Dams across Water Courses. William J. McAlpine.

A new method of detecting overstrain in iron and other metals, and its application in the investigation of the causes of accidents to bridges and other constructions. Robert H. Thurston.

The Law of Tidal Currents. J. H. Striedinger.

The South Pass Jetties; descriptive and incidental notes and memoranda. E. L. Corthell.

Construction and operation of the Incline Plane Railroad at Madison, Ind. M. J. Becker.

Notes on the preceding paper, by Octave Chanute.

Reminiscences and experiences of early engineering operations on railroads, with especial reference to steep inclines. No. 1, W. Milnor Roberts. No. 2, William J. McAlpine.

Resistances on Railway Curves. S. Whinery.

Steam Engine Economy. A uniform basis for comparison. Charles E. Emery.

Agricultural Drainage. Ed. N. Kirk Talcott.

A graphic method of representing railroad accounts. Charles Latimer.

Science, old and new. Its relation to Engineering. W. Milnor Roberts.

The Levees of the Mississippi and their crevasses. B. M. Harrod.

Brick Arches for Large Sewers. R. Hering.

Members of the Society are earnestly requested to furnish information or memoranda upon any of the subjects referred to. They are also invited and expected to take part in the discussions either in person or by sending to the Secretary notes for presentation.

In either case, it will assist the Committee in arranging the details for sessions of the Convention, if members expecting to take part in the discussion will notify the Secretary at once to that effect.

Reports will be expected as follows:

From Committees on Gauging of Streams, J. Jas. R. Croes, Chairman; Permanent Quarters for the Society, John Bogart, Chairman; Resistances of Railway Trains, William P. Shinn, Chairman; Uniform Accounts and Returns of Railroad Companies, William P. Shinn, Chairman; Tests of American Iron and Steel, W. Sooy Smith, Chairman; On at the Paris Exposition, Geo. S. Morrison, Chairman; Exhibit The Centennial Commission of the Society, Theodore G. Ellis, Chairman.

Members who intend to be present at the Convention are requested to notify the Secretary to that effect, either upon the blanks already sent out or otherwise.

Transportation for members has been already secured over some lines; and it is hoped will be obtained over others. Notice of what can be furnished will be sent to members expecting to visit the Convention.

The Boston Society of Civil Engineers; the Engineers' Club of the Northwest, of Chicago; the Engineers' Club of St. Louis, and the Engineers' Club of Philadelphia have been invited to attend the Convention. The Local Committee has made arrangements for members at reduced rates ($3.50 per day) at the Hotel Brunswick, on Boylston street, which is opposite the place of meeting of the convention.

Invitation to visit the works of interest at and in the vicinity of Fall River is extended to all visitors to the Convention by Mr. Wm. Rotch, Chief Engineer of the Fall River Water Works, and member of the Society. Among these works are an iron bridge for railroad and highway over the Taunton River; the water works of the city, and some of the forty cotton mills, which together, contain 1,250,000 spindles. These works can be visited either before or after the convention.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Concord, annual meeting, at the Opera House in Concord, N. H., May 28, at 11 a. m.

Portland, Saco & Portsmouth, annual meeting, at the office in Kittery, Me., June 3, at 11 a. m.

Dividends.

Dividends have been declared as follows:

Chicago & Northwestern, 3½ per cent. on the preferred, and 3 per cent. on the common stock, payable June 27. Transfer books will close June 18.

Railroad Conventions.

The twelfth annual meeting of the *Master Car-Builders' Association*, will be held at Niagara Falls, N. Y., beginning Wednesday, June 12.

The Yardmasters' Mutual Benevolent Association will hold its annual convention in Chicago, June 5.

Foreclosure Sales.

The *Arkansas Valley* road was sold under foreclosure of first mortgage at Denver, Col., May 7, and bought by J. D. Perry and D. K. Ferguson for account of the bondholders. The road is 76½ miles long, from Kit Carson, Col., to La Junta, and had a bonded debt of $1,125,000. It was built in the interest of the Kansas Pacific and was worked by that company, but the extension of the Atchison, Topeka & Santa Fe to Pueblo took away most of its business, and we believe it has not been worked for some months.

Mail Routes.

Mail service has been ordered over new railroads or extensions of old lines as follows:

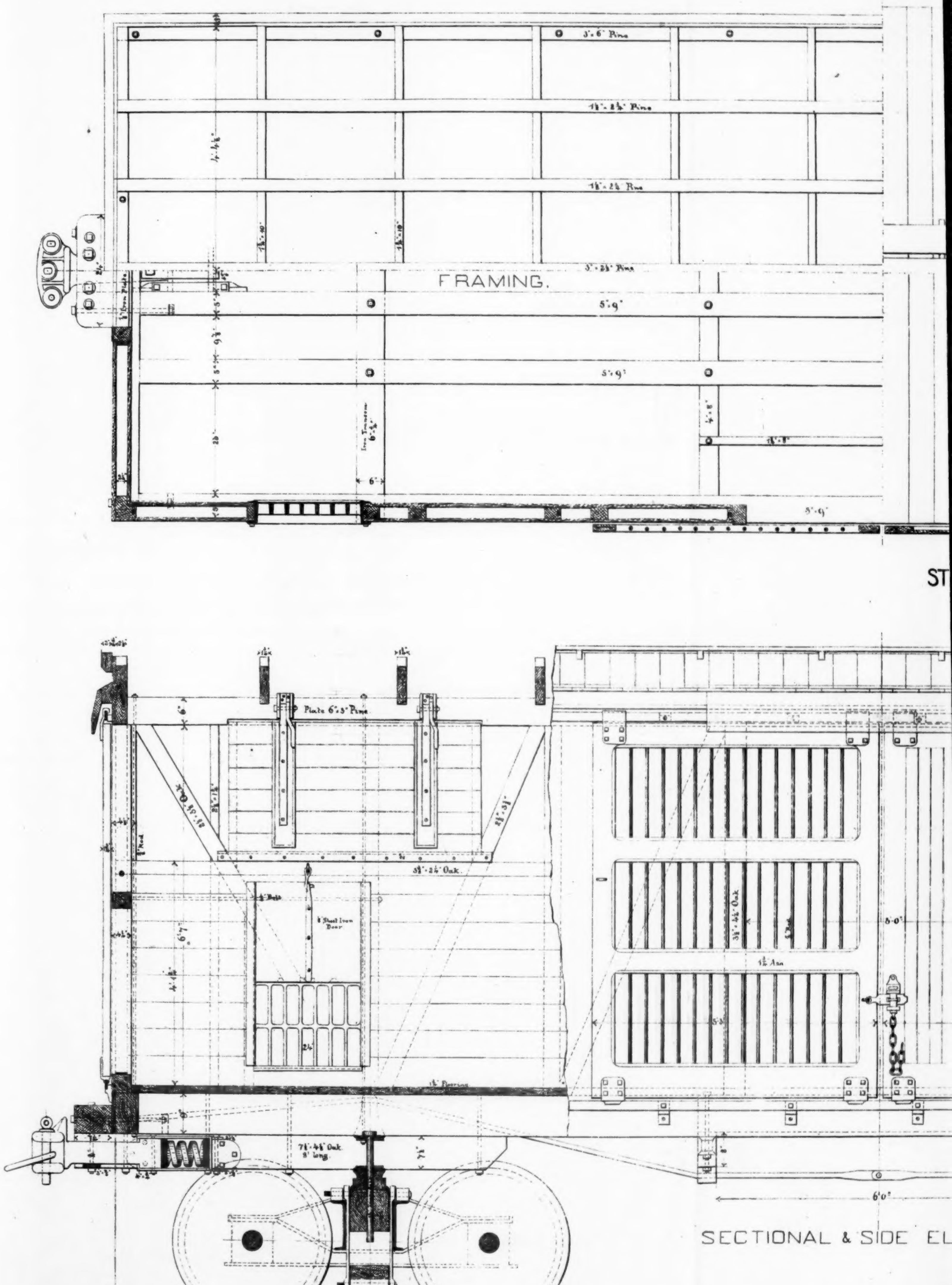
East Line & Red River, new service, from Jefferson to Pittsburgh, Texas, 49.2 miles.

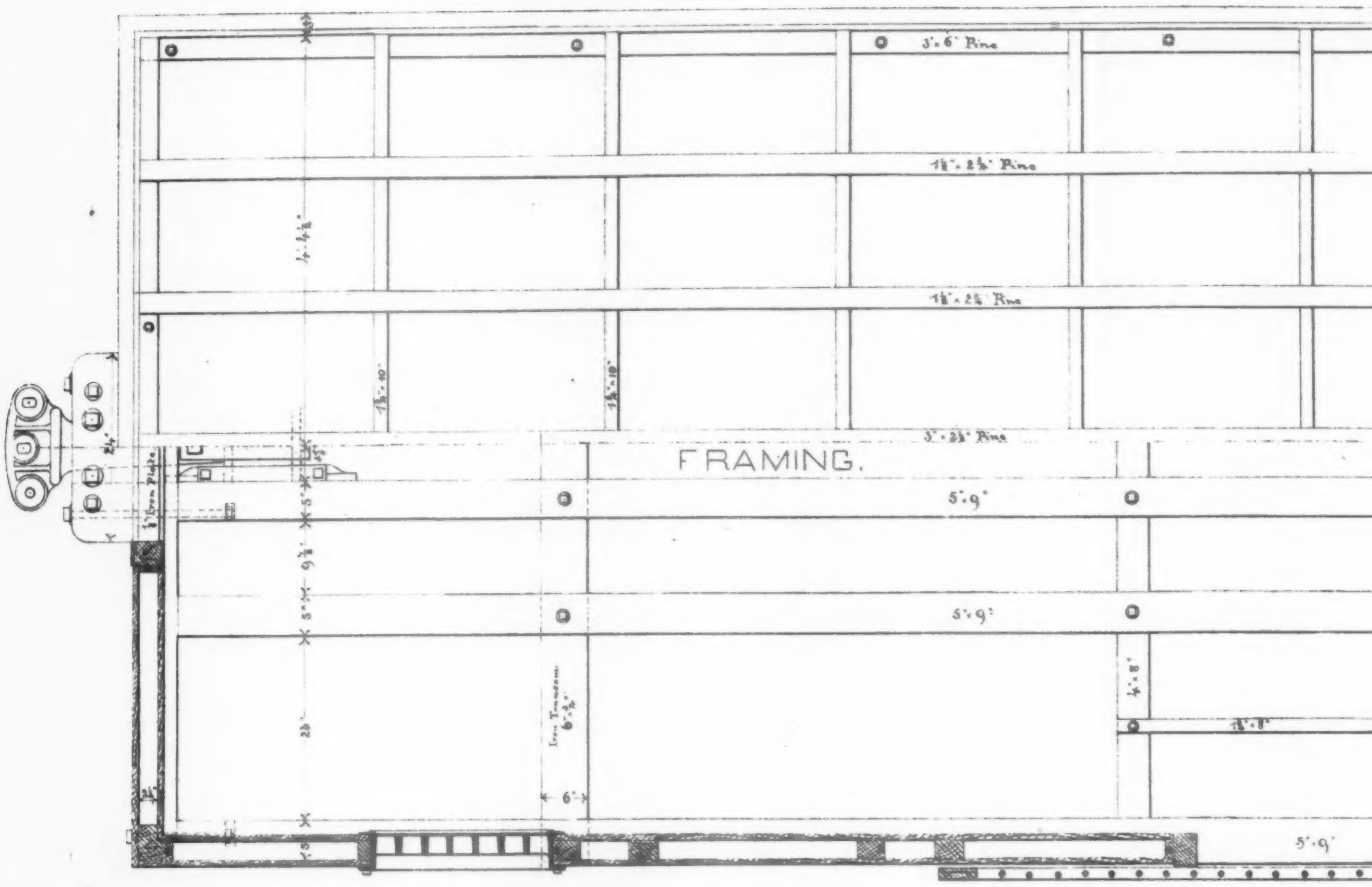
Purchasing Agents' Association.

The annual convention of the Purchasing Agents' Association met at the St. Nicholas Hotel, New York, May 21, with a fair attendance of members. Among the members present were A. C. Armstrong, President, of the Lake Shore & Michigan Southern; A. G. Thompson, Secretary, St. Louis & Southeastern; G. C. Breed, Louisville & Nashville; W. S. Cuddy, St. Louis, Iron Mountain & Southern; C. M. Higginson, Chicago, Burlington & Quincy; A. W. Sumner, Northern Central; E. P. Miller, Indianapolis, Bloomington & Western; Frank A. Iddings, North Pennsylvania; H. H. Elliott, Eastern Railroad, J. H. Holway, Atlantic & Great Western; A. H. Campbell, Missouri River, Fort Scott & Gulf; George Tozzer, Indianapolis, Cincinnati & Lafayette; T. C. Purdy, New York & Oswego Midland; R. C. Moore, New York & Harlem; W. C. Alderson, Lehigh Valley; O. N. Lull, Cumberland Valley.

After organization Tuesday morning a report on Car-Axle Material was received, or rather two reports—a majority and a minority report, the latter asking for more time. After about an hour's discussion, further consideration of it was postponed until Wednesday morning. A report on Lubricating Materials was then read and discussed. The other reports which were to be read at the convention, which was expected to continue until Thursday, were "Car-Brasses," "Bearings and Bolster Springs," "Wheel Mileage," "Stationery and Printing" and "Disposition of Old Material."

The second day's proceedings were opened by a report


3'-6" Pine
1½"-2½" Pine
1½"-2½" Pine
3"-2½" Pine
FRAMING.
5"-9"
5"-9"
6"
5"-9"
ST
Plate 6"-3" Pine
3⅞"-2¼" Oak.
¼" Sheet Iron Door
6'-7"
24
1¼" Flooring
7½"-4½" Oak 8' long
3½"-4½" Oak
1½" Ash
5'-3"
8'-0"
6'0"
SECTIONAL & SIDE EL
4'-8"
18'8" between Truck Centers
28'-0" Out to Out of End Sills


FRAMING.
3"×6" Pine
1½"×2½" Pine
1½"×2½" Pine
3"×2½" Pine
5'-9"
5'-9"
5'-9"
Iron Transom 6"×¾"
6"
4'-8"
5'-9"

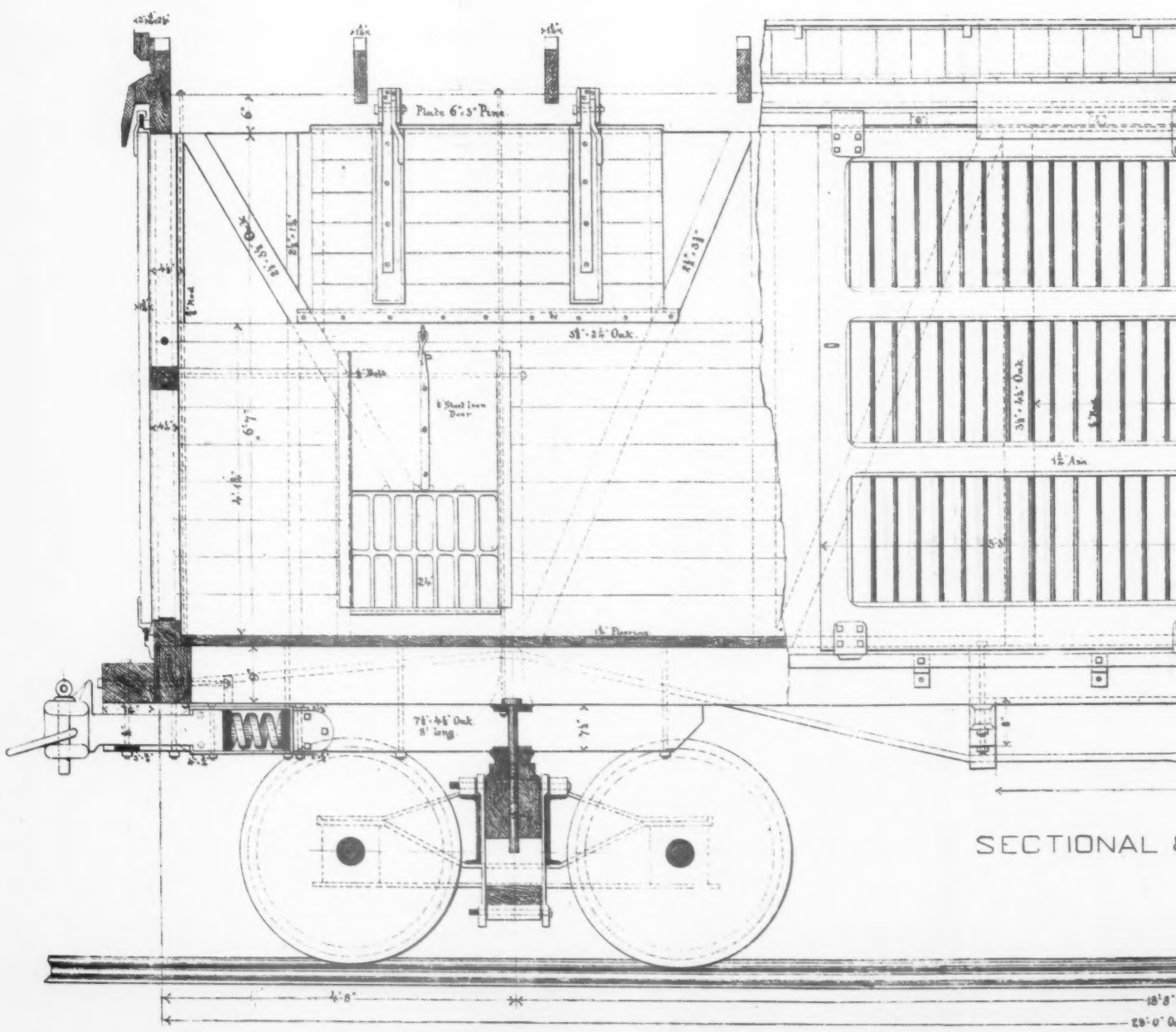
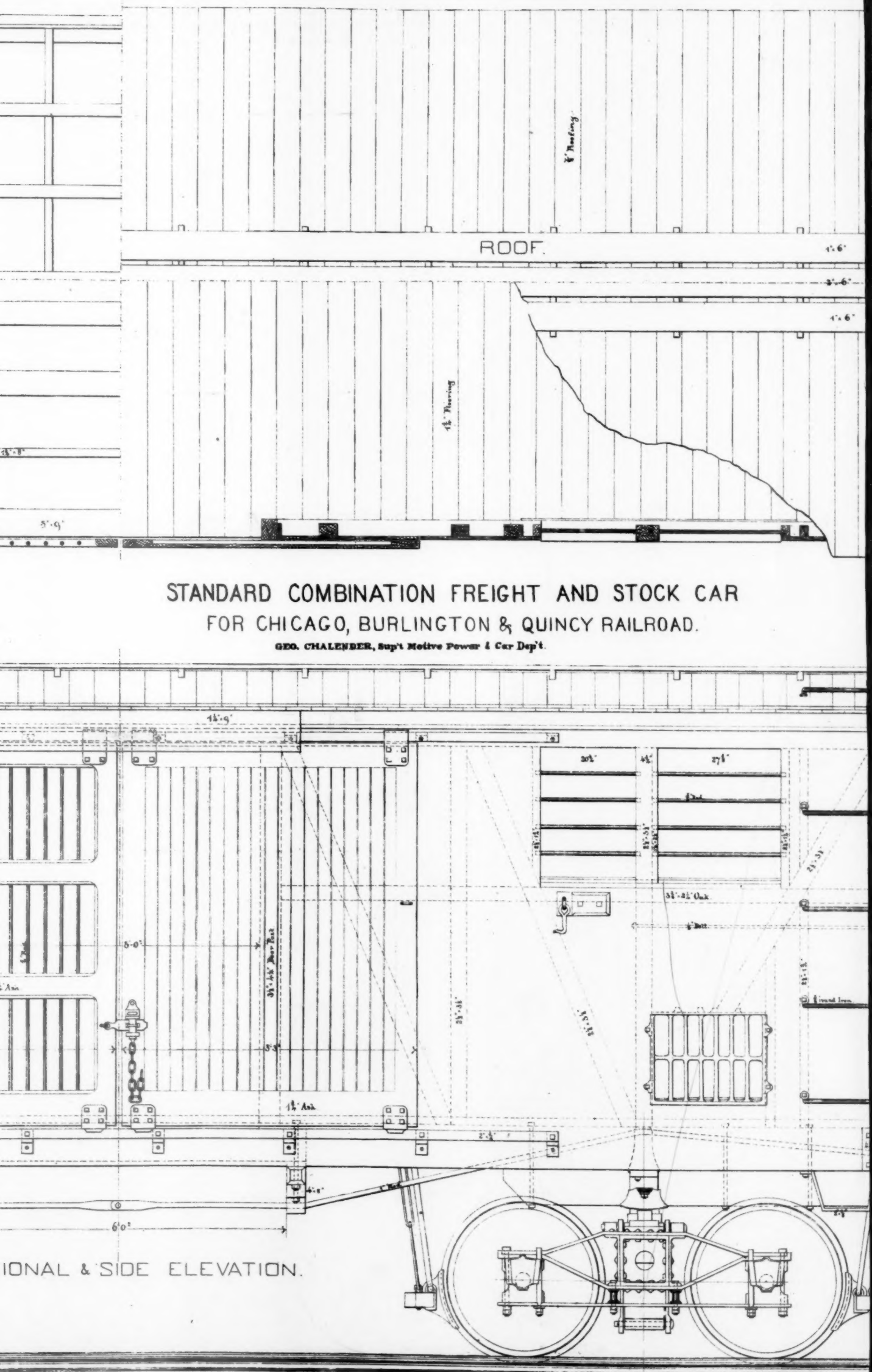


Plate 6"×5" Pine
3½"×2½" Oak.
8' Steel Iron Door
1½" Bolts
1½" Iron
7½"×4½" Oak 8' long.
4'-8"
18'-8"
28'-0"



STANDARD COMBINATION FREIGHT AND STOCK CAR

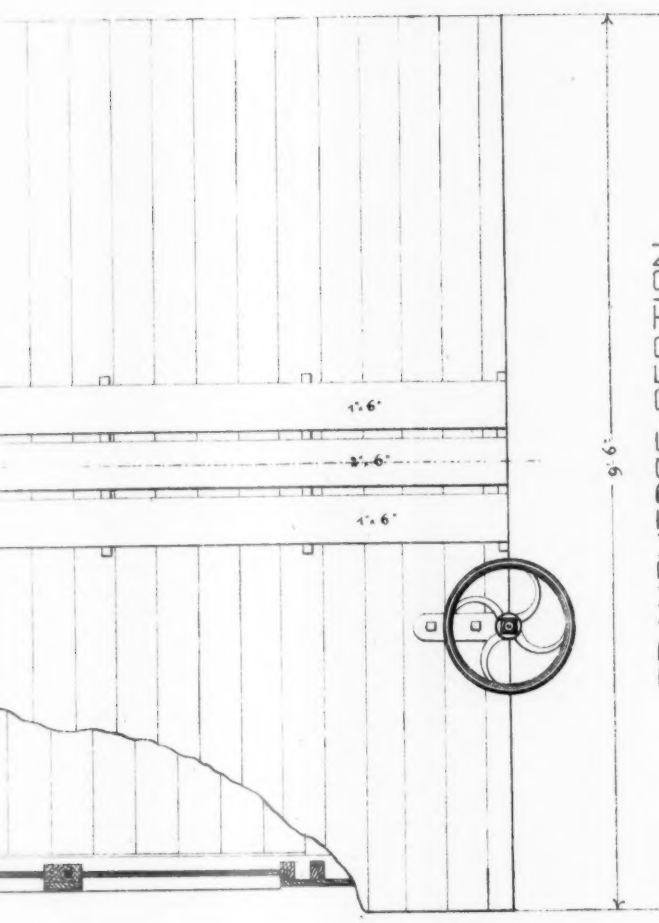
FOR CHICAGO, BURLINGTON & QUINCY RAILROAD.

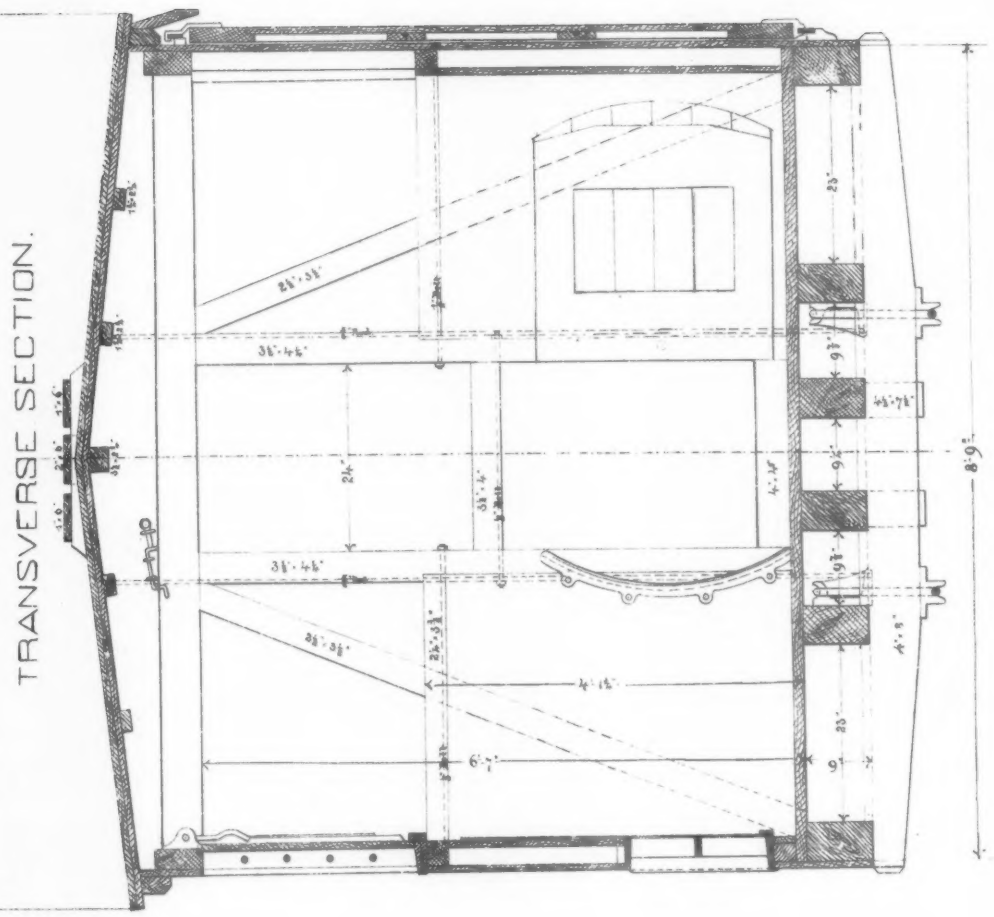
GEO. CHALENDER, Sup't Motive Power & Car Dep't.

IONAL & SIDE ELEVATION.

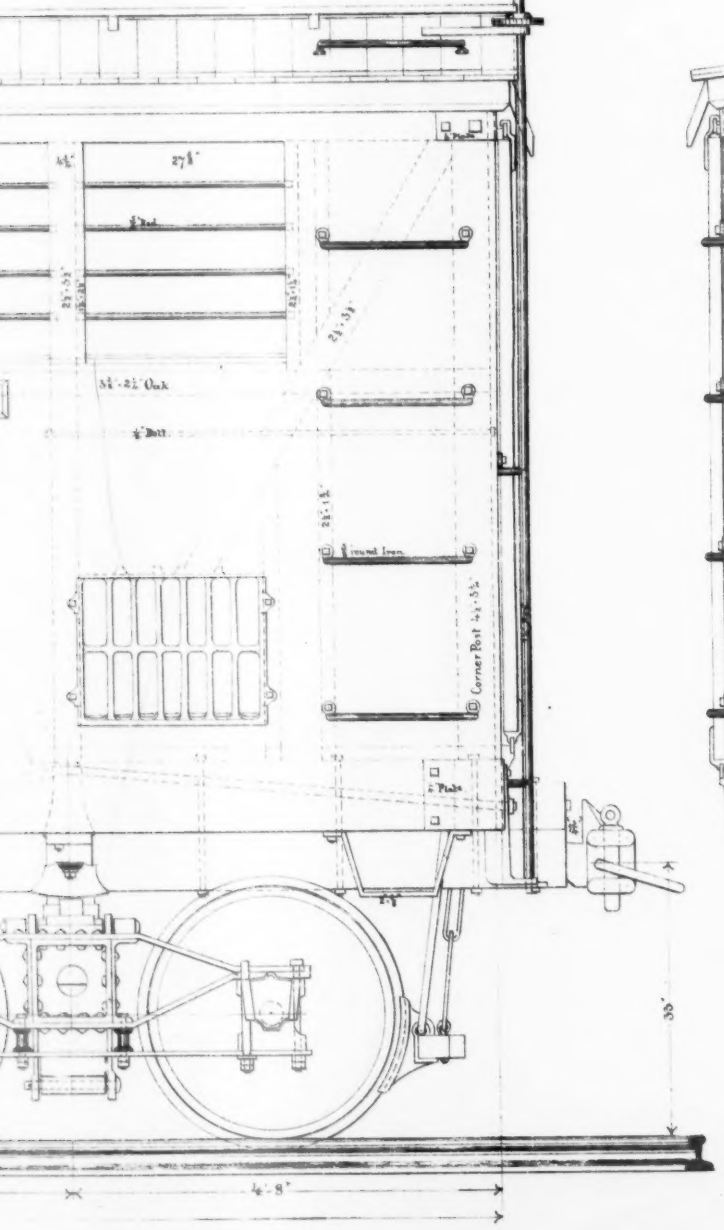
STOCK CAR

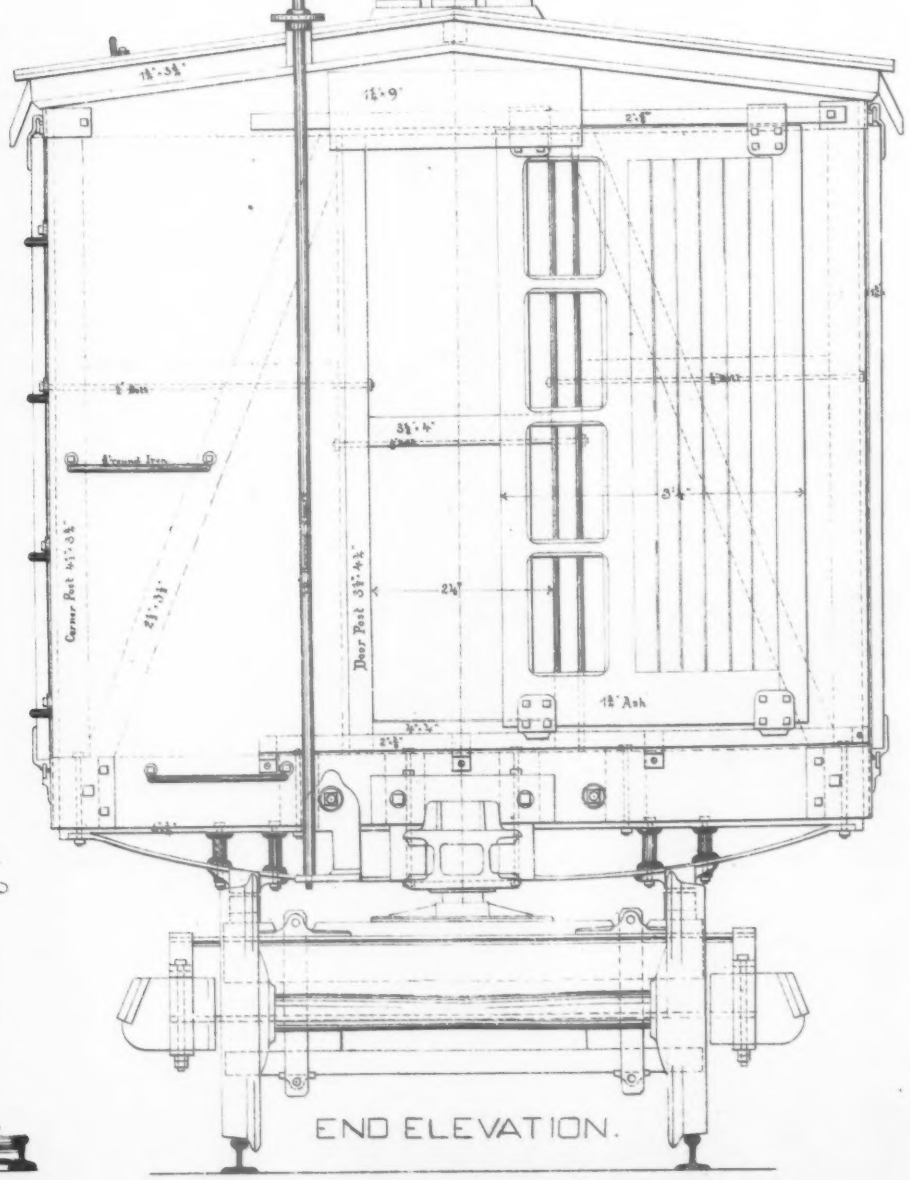
RAILROAD.





TRANSVERSE SECTION.





END ELEVATION.

Photo-Lith. by ROB.A WELCKE 176 William St N.Y.

from the Committee on Individual Car Mileage, which produced a long discussion. Many of the members were in favor of some system of keeping and reporting mileage, its especial interest to purchasing agents being that it enabled them to ascertain better the life of car-wheels, about which there is now much doubt. The Davies system of reporting mileage was favored by many members, and at the close of the discussion the report of the committee was adopted.

The report of the Committee on Stationery and Printing was then taken up. There was a general expression of opinion in favor of taking the lowest bids on individual blanks, instead of letting the whole printing of a road under one contract.

A discussion on the disposition of old material, other than old rails, followed. Several speakers favored frequent sales of scrap, as often as once a month on large roads, in order to keep the yards clear and save interest. It was estimated that on 100 miles of road the sales of old material should produce a very considerable sum, on a road with large business as much as $100,000 a year. The subject was continued until the next day, the third of the convention.

The convention sits with closed doors. At the present writing it is still in session.

ELECTIONS AND APPOINTMENTS.

Ashuelot.—At the annual meeting in Keene, N. H., May 14, the following directors were chosen: Henry Colony, J. E. Colony, Frank H. Colony, S. W. Hale, F. F. Lane, E. F. Lane, Hubert E. Lane. The board elected S. W. Hale, President; F. F. Lane, Clerk; E. F. Lane, Treasurer. The road is leased to the Connecticut River Company.

Atchison, Solomon Valley & Denver.—The following officers were chosen at a recent meeting: President, R. M. Pomeroy, Boston; Vice-President, A. S. Barnes, New York; General Manager, W. F. Downs, Atchison, Kan. This is the company which is building the extension of the Central Branch, Union Pacific, westward from Concordia, Kansas.

Atchison, Topeka & Santa Fe.—At the annual meeting in Topeka, Kan., May 16, the following directors were chosen: L. Severy, Lyon, Kan.; C. K. Holliday, Topeka, Kan.; B. F. Stringfellow, Atchison, Kan.; Thomas Sherlock, Cincinnati; S. A. Kent, Chicago; Thomas Nickerson, Joseph Nickerson, I. T. Burr, F. H. Peabody, B. P. Cheney, Alden Speare, C. W. Pierce, Charles J. Paine, Boston. The new directors are Messrs. Kent, Sherlock and Stringfellow, who succeed Ginery Twichell, D. L. Lakin and Charles W. Opdyke.

Black River & Morristown.—At a recent meeting David Bearup was chosen President and A. A. Holmes, Secretary and Treasurer. The road is leased to the Utica & Black River.

Central Vermont.—At the annual meeting in St. Albans, Vt., May 15, the old board was re-elected as follows: J. Gregory Smith, W. C. Smith, Bradley Barlow, St. Albans, Vt.; James R. Langdon, Montpelier, Vt.; J. P. Clark, Milton, Vt.; John W. Stewart, Middlebury, Vt.; B. B. Smalley, Burlington, Vt.; John H. Kimball, Bath, Me.; George M. Rice, Worcester, Mass.; B. P. Cheney, Otis W. Drury, Jacob Edwards, James W. Emery, Boston.

Chatfield.—The officers of this new company are: President and General Manager, J. F. O'Ferrall; Vice-President, Miles White; Secretary, H. S. Griswold; Treasurer, G. H. Haven. Offices at Chatfield, Minn.

Chester & Lenoir.—Mr. James Mason, Secretary and Treasurer, has been appointed Superintendent also.

Chicago, Rockford & Northern.—At the annual meeting recently, the following directors were chosen: R. H. Tinker, D. B. Waterman, F. E. Hinckley, B. T. Lewis, John E. Blunt. The Board elected D. B. Waterman, of Aurora, Ill., President; B. F. Lewis, Secretary. The road is worked by the Chicago & Iowa.

Denver & Boulder Valley.—At the annual meeting in Denver, Col., May 6, the following directors were chosen: J. D. Perry, S. M. Edgell, John Pierce, D. H. Moffatt, Jr., W. S. Cheeseman, R. R. McCormick, T. F. Oakes. The board elected John Pierce, President; W. S. Cheeseman, Vice-President; R. R. McCormick, Secretary; D. H. Moffatt, Jr., Treasurer.

Denver Pacific.—At the annual meeting in Denver, Col., May 6, the following directors were chosen: Robert E. Carr, C. S. Greeley, John D. Perry, Adolphus Meier, D. S. Moffat, Jr., W. S. Cheeseman, F. B. Crocker, F. L. Ames, D. M. Edgerton. The board elected D. M. Edgerton, President; D. H. Moffat, Jr., Vice-President and Treasurer; R. R. McCormick, Secretary.

Edgefield Branch.—This company has been organized with the following officers: President, D. R. Durisoe; directors, M. W. Gary, Lewis Jones, S. W. Nicholson, A. J. Norris, H. Parker, J. C. Shepherd; Secretary and Treasurer, John L. Addison. Office at Edgefield, S. C.

Elmira & Williamsport.—At the annual meeting, held May 6, Wm. C. Longstreth was chosen President in place of Thomas Kimber, Jr., who declined a reëlection, and the following directors were elected: Wm. D. Lewis, Thomas Kimber, Jr., Alexander S. Diven, Thomas Neilson, Wm. Read Fisher, Lewis P. Geiger. The board elected Lewis P. Geiger, Treasurer; Thomas Neilson, Secretary. The road is leased to the Northern Central.

Hanover Junction, Hanover & Gettysburg.—At the annual meeting in Hanover, Pa., May 13, Capt. A. W. Eichelberger was reëlected President, with the following directors: Matthew Eichelberger, Peter Flickinger, Jacob Forney, William Grumbine, Stephen Keefer, John Nyman, Charles W. Slagle, George Swope, R. M. Wirt, Reuben Young.

Hannibal & St. Joseph.—Mr. Theodore L. Dunn has been appointed Chief Engineer. He has been on the Wabash for some time.

Kendall & Eldred.—This company was recently organized with the following directors: Wm. G. Roberts, Allegheny Bridge, Pa.; Edwin J. Ralph, Emporium, Pa.; Charles W. Mackay, W. J. Welsh, Franklin, Pa.; Charles S. Cary, Olean, N. Y.; George B. Gates, Sherman S. Jewett, Buffalo, N. Y. The board elected George B. Gates, President; C. S. Cary, Secretary and Treasurer.

Manchester & Keene.—At the annual meeting in Keene, N. H., the following directors were chosen: Theodore H. Wood, Henry Colony, Samuel W. Hale, S. G. Griffin, Geo. B. Twichell, C. Robb, Milan Harris, Dana Sargent, John H. Buttrick, David Gregg, Samuel G. Dearborn. The board elected Theodore H. Wood, President; John H. Buttrick, Treasurer; Thomas E. Hatch, Assistant Treasurer and Clerk.

Missouri, Kansas & Texas.—At the annual meeting in Parsons, Kan., May 15, the following directors were chosen: H. C. Cross, Emporia, Kan.; C. H. Pratt, Humboldt, Kan., B. P. McDonald, Fort Scott, Kan.: A. D. Jaques, Sedalia, Mo.; John Sevier, Louisville, Ky.; John R. Agnew, George Clark, John Elliott, Benjamin Hart, H. A. Johnson, N. L. McCready, Henderson Moore, James H. Stebbings, New York.

Morgan's Louisiana & Texas.—The New Orleans *Bee* says: "The new company incorporated and organized under the auspices of Mr. Morgan, and charged to continue this work for the consummation of that purpose, is composed of Mr. Charles A. Whitney, son-in-law of the deceased, and Messrs. A. C. Hutchinson, John B. Richardson and George Pandely; the President to be Mr. Whitney; the directors, Messrs. Whitney and Hutchinson; the Secretary, Mr. Richardson; and the General Superintendent, Mr. Pandely."

New York & Harlem.—At the annual meeting in New York, May 21, the following directors were chosen: James H. Banker, Samuel F. Barger, Abraham B. Baylis, Chauncey M. Depew, John B. Dutcher, Joseph Harker, Wm. H. Leonard, Robert J. Niven, Augustus Schell, Cornelius Vanderbilt, Wm. H. Vanderbilt, Wm. K. Vanderbilt, Wm. C. Wetmore.

New York, Lake Erie & Western.—Mr. B. W. Spencer has been elected Treasurer. He has been connected with the company (formerly the Erie) for eighteen years, and has been cashier and Assistant Treasurer for several years.

Ohio & Mississippi Railroad Employés Benevolent Association.—The annual meeting was held in Flora, Ill., May 14, and the following officers elected: W. H. McCormick, President; W. F. Larimer, Secretary; Andrew Donaldson, Treasurer; C. M. Stanton, R. Smith, H. G. Post, B. F. Bond, directors. Eight directors hold over.

Pittsburgh, Fort Wayne & Chicago.—At the annual meeting in Pittsburgh, May 15, the following directors were chosen for four years: R. R. Springer, Cincinnati; Pliny Hoagland, Fort Wayne, Ind.; J. N. Hutchinson, Philadelphia.

St. Cloud & St. Peter.—The officers are as follows: President, W. T. Bonniwell; Vice-President, H. Stevens; Secretary, D. A. Adams; Treasurer, W. D. Joubert; Attorney, C. H. Strobeck; General Manager, S. G. Anderson; Chief Engineer, P. Simons.

Savannah, Skidaway & Seaboard.—At the annual meeting in Savannah, Ga., May 15, the following directors were chosen: G. W. Anderson, Thomas Arkwright, H. Brigham, J. S. Claghorn, J. E. Gaudry, A. L. Hartridge, J. W. Lathrop, Clavius Phillips, J. Rauers, all of Savannah.

Spencer.—This company has secured its certificate and has completed a permanent organization by electing the following directors: Dexter Bullard, Abraham Capen, James Capen, Erastus Jones, Charles N. Prouty, David Prouty, Isaac L. Prouty, Richard Sugden, J. W. Temple. The board elected David Prouty, President; Isaac L. Prouty, Vice-President; Charles N. Prouty, Clerk and Treasurer. Offices at Spencer, Mass.

Springfield, Effingham & Southeastern.—At the annual meeting in Palestine, Ill., recently, the following directors were chosen: J. J. Funkhouser, S. D. Smith, E. G. Lyon, W. A. McGillis, H. Steele, E. E. Murphy, E. Pratt Buell, E. C. Haskett, G. C. Mitchell. The board elected J. J. Funkhouser President; E. Pratt Buell, Vice-President; G. C. Mitchell, Secretary; L. B. Martin, Treasurer.

Tennessee Coal & Railroad Company.—At the annual meeting in Nashville, Tenn., recently, the following directors were chosen: W. H. Cherry, A. M. Shook, Thomas O'Connor, Samuel McKinney, Dr. William Morrow.

Wabash, Chester & Western.—The officers of this company, successor to the Iron Mountain, Chester & Eastern, are: President, W. G. Barnard; Vice-President, Z. T. Cole; Treasurer and General Manager, C. B. Cole; Secretary, H. C. Cole; General Superintendent, J. L. Hinckley; Auditor and General Freight and Ticket Agent, C. E. Kingsbury.

Whitewater Valley.—The purchasers of this road have appointed Elijah Smith General Manager. He has appointed W. W. Worthington General Superintendent. Mr. Smith is also Receiver and Mr. Worthington, General Superintendent of the Fort Wayne, Muncie & Cincinnati.

PERSONAL.

—Mr. James F. How, Vice-President of the St. Louis, Kansas City & Northern Company, filed a voluntary petition in bankruptcy in St. Louis, May 10. His embarrassements are said to have been caused chiefly by mining operations in Colorado.

—Mr. Moses Allan, who was for ten years Master Mechanic of the old Utica & Schenectady road, died last week at his residence in Utica, N. Y. Since he left the road he has been in business as a machinist in Utica, and was well known as an expert mechanic.

—Mr. Wm. A. Wright, a prominent citizen of Wilmington, N. C., died in that city May 15, aged 71 years. He was one of the first incorporators of the Wilmington & Weldon Company and has served continuously as a director until his death, a period of 45 years. He was probably the oldest railroad director in service in the United States.

—Mr. John Baird, Master Mechanic of the Northern Division, Intercolonial Railway, was recently presented with a valuable gold watch by the employs of the Campbellton shops.

—Mr. T. E. Sickels, Chief Engineer of the Union Pacific, is one of the judges in the Department of Civil Engineering at the Paris Exposition.

—Mr. Albert Borsig, the well-known locomotive engineer of Berlin, died on the 10th April at the early age of 49. The works were founded by his father in 1837, and have since the beginning turned out over 3,600 locomotives for Germany, Russia, Sweden, Denmark, Holland and Austria, and for the Dutch colonies. Mr. Borsig was one of the largest employers of labor, the number of his workmen at his Berlin works, and at his iron and steel works and coal mines in Silesia, exceeding 10,000. How successfully the works have been carried on is shown by the fact that Mr. Borsig's father began work with a capital of £1,500 lent to him by a Berlin tradesman, and that the son died one of the wealthiest men in Germany, having left property worth about three millions sterling. Under the will of the late Mr. Borsig the works will be conducted by a board of trustees until his children (the eldest boy being only 11 years) become of age.

—The reports of the resignation of Mr. Robert Harris, President of the Chicago, Burlington & Quincy Company, and the accession of Mr. J. M. Forbes, of Boston, to his place, seem to have been simply premature, as it is officially stated that these events are soon to occur. It was rumored at the time of the last election that Mr. Forbes was seeking to displace Mr. Harris, but when the election came it appeared that actually Mr. Forbes' proxies were entrusted to Mr. Harris. Mr. Harris is one of the few railroad presidents whose profession is and always has been railroad business. He was for some time a civil engineer, but most of his service has been in the operating department as assistant superintendent and superintendent, having filled these positions for many years on the Chicago, Burlington & Quincy Railroad, before he became President. His ability and efficiency as a manager may be inferred from the fact that throughout the Northwest the Chicago, Burlington & Quincy Railroad has been universally pointed to as a model, having the very highest reputation for thoroughness of construction and maintenance, excellence of rolling stock and appliances, enterprise in the testing and adopting improvements, carefulness and skill in the running of trains, the high character of its employes, and its conscientious and liberal treatment of them and the patrons of the road as well. Mr. Harris has been one of the closest students of transportation problems in this country; few men have been so devoted to their profession, and certainly none has performed the duties of a railroad officer more earnestly or conscientiously. Mr. Harris is still in the prime of life, but his health is now delicate, and it is reported that he will spend some months abroad after his resignation, for rest and recreation.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Dec. 31:	1877.	1876.	Inc. or Dec.	P. c.
Pitts., Ft. Wayne & Chicago	$6,928,856	$7,853,849	D. $924,993	11.8
Expenses	4,064,398	4,787,131	D. 722,763	15.1
Net earnings	$2,864,458	$3,066,688	D. $202,230	6.6
Earnings per mile	14,793	16,768	D. 1,975	11.8
P. c. of expenses	58.66	60.95	D. 2.29	3.8
Southern Minnesota	687,063	636,841	I. 50,222	7.9
Expenses	390,797	413,197	D. 22,400	5.4
Net earnings	$296,266	$223,644	I. $72,622	32.5
Earnings per mile	4,042	3,746	I. 296	7.9
P. c. of expenses	56.88	64.88	D. 8.00	12.3

Four Months ending April 30:	1878.	1877.			
Bur., Cedar Rapids & Northern	$553,026	$287,687	I.	$265,339	92.2
Net earnings	176,252	63,088	I.	112,564	176.7
P. c. of expenses	68.13	77.78	D.	9.65	12.4
Cairo & St. Louis	60,958	80,424	D.	19,466	24.2
Clev., Mt. Vernon & Delaware	120,403	113,137	I.	7,266	6.4
Dakota Southern	67,117	49,377	I.	17,740	35.9
Paducah & Memphis	66,732	57,275	I.	9,457	16.5
Pittsburgh, Cin. & St. Louis	1,050,643	.....		.....	.....
Net earnings	429 961	.....		.....	.....
P. c. of expenses	59.06	.....		.....	.....
Southern Minnesota	238,667	135,494	I.	103,173	76.1
Month of April:					
Cairo & St. Louis	$18,190	$19,460	D.	$1,270	6.5
Clev., Mt. V. & Del	32,322	31,566	I.	756	2.4
Dakota Southern	19,589	18,806	I.	783	4.2
Detroit & Milwaukee	77,364	76,636	I.	728	1.0
Intercolonial	121,372	99,151	I.	22,221	22.4
Paducah& Elizabethtown	22,841	25,614	D.	2,773	10.8
Paducah & Memphis	14,109	12,272	I.	1,837	15.0
Southern Minnesota	59,900	31,000	I.	28,900	93.2
First Week in May:					
Denver & R. Grande	$19,348	$15,215	I.	$4,033	26.5
St. L., I. Mt.& Sout'n	70,300	74,954	D.	4,654	6.2
Second week in May:					
Denver & R. Grande	$20,075	$16,656	I.	$3,419	20.5
Week ending May 10:					
Great Western	$78,618	$80,763	D.	$2,145	2.7
Week ending May 11:					
Grand Trunk	$150,269	$178,144	D.	$27,875	15.7

Delaware Fruit Traffic.

The shipments of strawberries over the Delaware Railroad have been very fair this season, 107 car-loads up to May 20, and other small fruits promise well. The latest estimate of the peach crop is as follows for Delaware and the Eastern Shore of Maryland: Main line of Delaware Railroad, 2,200,000 baskets; Kent County and Queen Anne's & Kent roads, 700,000; Dorchester & Delaware road, 75,000; Maryland & Delaware road, 250,000; Junction & Breakwater road, 75,000; total estimate rail shipments, 3,300,000 baskets. In addition 700,000 baskets are expected to go by water.

Coal Movement.

Coal tonnages for the week ending May 11 are reported as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Anthracite	378,477	471,626	D. 93,149	19.8
Semi-bituminous	58,997	68,914	D. 9,917	14.4
Bituminous, Pennsylv'a.	35,845	35,066	I. 779	2.2

An increase is reported in the demand for Cumberland and Clearfield coals, chiefly to fill contracts for steamship use.

The Anthracite Board of Control met in New York, May 21, and fixed the June production at 1,734,000 tons, allotted as follows: Philadelphia & Reading, 633,000; Lehigh Valley, 304,000; Central, of New Jersey, 219,000; Delaware, Lackawanna & Western, 205,000; Delaware & Hudson Canal, 141,000; Pennsylvania Railroad, 125,000; Pennsylvania Coal Company, 107,000. This will make the production for the six months ending June 30 about 7,000,000 tons. The board also recommended an increase in the price of coal of from 10 to 25 cents per ton.

Grain Movement.

For the week ending May 11 receipts and shipments of grain of all kinds for the past five years have been, in bushels:

Receipts of eight Northwestern markets:

1878.	1877.	1876.	1875.	1874.
4,369,785	2,853,906	2,302,046	2,536,565	3,169,221

The receipts this year are 53 per cent. greater than last year. They are smaller than for the previous week, but larger than for any other week since navigation closed last fall.

The total shipments of these same markets were:

1878.	1877.	1876.	1875.	1874.
4,822,441	2,525,207	3,841,466	3,478,238	3,922,086

This year the total shipments are 91 per cent. greater than last.

The quantities *shipped by rail* and their percentage of the above total shipments were:

1878.	1877.	1876.	1875.	1874.
1,901,939	1,214,861	2,302,940	1,236,079	929,349
39.5 p. c.	48.1 p. c.	60.1 p. c.	35.6 p. c.	23.7 p. c.

The rail shipments were 57 per cent. greater than last year, but 17½ per cent. less than in 1876, when the first great diversion from lake to rail took place. The rail shipments this year are much the largest since navigation opened, showing the effects of the reduction in rail rates. The total shipments also are the largest of the season.

The receipts of grain this week at the seven Atlantic ports were:

1878.	1877.	1876.	1875.	1874.
5,704,275	2,684,629	3,909,903	1,642,615	4,635,555

The receipts this year are 112½ per cent. greater than last year. They have, indeed, not often been exceeded—in no week in 1876, and in 1877 only in the five weeks from Sept. 23 to Oct. 27, and one week in November.

Of the receipts at Atlantic ports during the week this year, 65 per cent. were at New York, 97 at Philadelphia, 9 at Baltimore, 7 at Boston, 5 at Montreal, 4.2 at New Orleans,

and 0.1 per cent. at Portland. Montreal enters the market fairly for the first time this season, the total receipts credited to it for the 18 weeks previously this year having been less than 50,000 bushels. The receipts at New York are enormous; they have been equaled but twice in two years—in the last two weeks of November last.

For the week ending May 20 the receipts of grain at New York were 2,958,004 bushels, against 1,082,500 bushels at Philadelphia, 849,684 at Baltimore and 498,180 at Boston. Of the receipts at New York, 32⅜ per cent. were by rail. The rail receipts, however, were the largest since arrivals by canal began, doubtless reflecting the effect of the recent low rail rates through from the West. The arrivals at Philadelphia by rail, however, were greater than those at New York, and those at Philadelphia and Baltimore together were twice as great as those at New York.

For the same week the shipments from Buffalo were 3,592,015 bushels, 32¼ per cent. of which was by rail.

The receipts at Buffalo were much less than the shipments and also less than the receipts of the preceding week.

For the same week the receipts and shipments at Chicago and Milwaukee were:

	Receipts.	Shipments.
Chicago	2,972,827	2,380,080
Milwaukee	935,800	516,100

The total movement is heavy, the rail movement, in spite of low rates, quite moderate.

Colorado Freight Rates.

The following schedule is reported from Chicago as adopted on freight to Kansas and Colorado points west of the Missouri River:

Chicago to	1st class.	2d class.	3d class.	4th class.
Fort Scott, Kan	$1.35	$1.20	$0.85	$0.65
Topeka, Kan	1.20	1.00	0.68	0.48
Denver, Col	3.25	2.70	2.20	1.70
Pueblo, Col	3.25	2.70	2.20	1.70
Black Hawk, Col	3.73	3.14	2.60	2.07
Cheyenne, Wyoming	2.75	2.30	1.75	1.55

East-Bound Freight Rates.

The following rates were agreed on at a meeting held in Chicago, May 16:

Chicago to	4th Class, per 100 lbs.	Grain, per 100 lbs.	Flour, per barrel.
Baltimore	22 cts.	17 cts.	34 cts.
Philadelphia	23 "	18 "	36 "
New York	25 "	20 "	40 "
Boston	30 "	25 "	50 "

Boxed, bulk and canned meats, hay and mill-feed to go at grain rates.

The tariff agreed upon last week and intended to put an end to the recent cutting of rates, went into effect May 17. The rates from Chicago to New York, on which all others are based, compare as follows with those of the tariff of April 1. They are in cents per 100 lbs.:

	Class— 1.	2.	3.	4.	Bulk meats.	Grain and provisions.	Fresh meat.	Poultry.	Cheese.
April 1	120	90	70	30	35	25	75	70	40
May 17	120	90	70	25	25	20	75	70	40

Seeds, which by the April 1 tariff were the same as cheese (40 cents), are reduced to 25. The number of classes in which there is a change may seem very small, but they in fact include probably nine-tenths of the traffic.

New York-St. Louis Rates.

The differences in the rates to Chicago and St. Louis from Eastern points have long been the subject of controversy, and, as is evident, any change in the differences of rates to Missouri River points, from Chicago and St. Louis needs to be accompanied by a similar change in the differences from the East to those cities. When the Southwestern Association established rates, it counted on effecting some change in the rates to St. Louis, and it was at one time intended to make one, and it was announced to be as follows, in cents per 100 lbs. from New York to St. Louis, for the four classes:

Old rates	96	78	66	54
New rates	87	70	58	46

After it was announced, however, some difficulty arose, and the announcement was withdrawn. With the old rates to Chicago and St. Louis, and the new ones from St. Louis and Chicago to Missouri River points, the Chicago merchant has a considerable advantage. Rates to St. Louis, or rather to East St. Louis, are based on the Chicago rate, a percentage being added which is in proportion to the distance by one of the routes; but the dispute is as to the routes which shall be taken as the standard. To the East St. Louis rate an arbitrary of 2 cents per 100 lbs. is added for all classes for freight shipped to St. Louis, which goes to the Bridge and Tunnel Company.

Petroleum Movement.

Stowell's *Petroleum Reporter* gives the production of crude oil from the Pennsylvania wells for April at 1,195,890 barrels, an increase of 223,080 barrels, or 22.9 per cent., over April, 1877. Shipments out of the oil regions, in barrels, for the month, were: 1878, 846,632; 1877, 903,526; decrease, 56,894 barrels, or 6.3 per cent.

THE SCRAP HEAP.

Railroad Manufactures.

It is reported that the Terre Haute Car Co., of Terre Haute, Ind., has a contract for 500 freight cars for the Vandalia Line.

Thomas, May & Co., at Indianapolis, are filling a large contract for car wheels for the Kansas Pacific, and have several orders to fill for Minnesota roads.

The Kansas Rolling Mill Co., at Rosedale, Kan., has taken the contract for the iron rails and splices for the extension of the Central Branch, Union Pacific from Concordia west 30 miles. The Tudor Iron Works, of St. Louis, will furnish the bolts, nuts and spikes.

The Elmira (N. Y.) Rolling Mill has the contract for the rails for the new Lockport & Buffalo road.

The Wilmington & Weldon Company is about to put up two of Ramsey's car shifters, one at Wilmington, N. C., and one at Goldsboro. The company has had one in use at Wilmington for some time.

The Howe Scale Co., recently put in three 40-ton track scales for the Atlantic & Great Western road.

Under a decree of the Court of Chancery a master will sell at public sale in Morristown, N. J., certain tracts of iron land owned by the Carbon Iron Co., in Randolph and Rockaway townships, Warren County, N. J.; also the leasehold interests of the company in the Dalrymple Mine in Morris County and in certain mines in West Milford township, Passaic County.

The Centralia Iron & Nail Co. is a new concern, which is about to put up a rolling mill and nail factory at Centralia, Ill.

Rising Fawn Furnace, in Dade County, Ga., is being run by the Receiver, and is now making about 1,100 tons of iron per month.

W. M. Kaufman & Co., at Sheridan, Pa., are building some ore cars for a Lebanon company.

The Chattanooga (Tenn.) Iron Co. has put its furnace in blast again, after making some repairs.

The Glendon Iron Co. has taken a new lease of the Hurd Mine, in Warren County, N. J., the old one having expired. The new lease is for 15 years at a royalty of $1 per ton, the minimum yearly rental to be $15,000.

The Steubenville (O.) Furnace & Iron Co. lately delivered 1,000 tons of iron to a Pittsburgh firm.

The Pencoyd Iron Works of A. & P. Roberts, in Philadelphia, have orders for 400 car axles for the Harrisburg Car Co.

The Pennsylvania Railroad shops at Altoona are to build 1,000 box cars for the Pennsylvania Company.

The Revolving Scraper Co., of Columbus, O., has established an agency for the sale of its goods in Hamburg, Germany.

The Taylor Iron Works, at High Bridge, N. J., is making the steel-tired wheels for one-half of the new passenger car and engine trucks now building for the New York Elevated road.

The Rogers Locomotive Works, at Paterson, N. J., last week received an order for four engines.

The Canadian Engine & Machinery Works at Kingston, Ont., has begun to deliver the engines contracted for to the Canadian Pacific road.

Park Brothers' Black Diamond Steel Works are being enlarged considerably. McNeal & Co., of Pittsburgh, have the contract for the iron work for the new gas furnaces. The enlargement is chiefly to meet the increased demand for steel boiler plate.

The Lamothe iron-tube freight cars, some 50 of which have been leased by the Chicago, Burlington & Quincy, for a year past, are being overhauled and repaired, preparatory to being returned to the owners.—*Aurora (Ill.) Beacon.*

The administration of the Belgian state railroads exhibits at Paris a car made to carry a load of 44,000 lbs.

The rolling mill and steam forge of Lightburn & Watson, at Locust Point in Baltimore, were burned down on the morning of May 20. The loss on buildings and the damage to machinery is estimated at $20,000, partly covered by insurance. The works had been idle for some time, but were to have started up this week.

Bridge Notes.

Cofrode & Saylor, of the Philadelphia Bridge Works, have just completed bridges over the Shenango, at Mahoningtown, and the Big Beaver, at Newport, for the Pittsburgh & Lake Erie road. They are at work on the bridge over the Ohio for the same road.

Miller & Jamieson, of Cleveland, O., are building an iron bridge of 75 feet span to go to St. Louis.

The Fort Pitt Boiler, Bridge and Tank Works of D. W. C. Carroll & Co., at Pittsburgh, have recently built a large iron roof for the new round-house of the Pennsylvania Railroad. Besides bridge and roof work, the works make boilers, iron boats and barges, and all sorts of oil-tank work, including tank cars. The works make special points of exact duplicates of parts, machine riveting, machine flanging and plate-planing machinery.

The County Commissioners of Hamilton County, O., will receive bids at the County Auditor's office in Cincinnati, until May 30, for a highway bridge of 285 feet clear span, over the Little Miami River. The bridge is to be a through bridge, Whipple truss, the trusses to be 290 feet between end-pins, and is to have a roadway 18 feet wide.

The Keystone Bridge Co., at Pittsburgh, has the contract for the iron coal trestles for the new Pittsburgh Water Works.

The Iron City Bridge Works, at Pittsburgh, are doing a lot of riveted girder work for the Pittsburgh & Lake Erie road. They are also building an oil store-house for the Pittsburgh, Ft. Wayne & Chicago road with iron roof, doors, floor, stairs and tanks.

The contract for the new free bridge over the river at East Saginaw, Mich., has been let to the Smith Bridge Co., of Toledo, O., for $15,000.

Tests of Iron and Steel.

A circular from the American Society of Civil Engineers, dated May 13, says:

"The following resolutions were adopted at the last convention of the Society. The Committee on Tests of Iron, Steel and other metals, now informs the board of direction that unless further legislation is had, the United States Board to test iron, steel and other metals, must soon pass out of existence, leaving its work unfinished and imperfect.

"The board of direction, therefore, calls the especial and immediate attention of the members of the Society to the resolutions, and to the fact that action in accordance with them must be taken at once to be of any avail."

Resolutions adopted at the ninth annual convention of the American Society of Civil Engineers:

"*Whereas*, In 1872, a committee of members of the American Society of Civil Engineers was appointed to take into account and to ascertain the best way of establishing a Board for the testing of such metals and alloys as form parts of the structures and machines required for use by the citizens of this country; and—

"*Whereas*, under this appointment, the committee proceeded in its labors so far as to obtain favorable action from the Congress of the United States, by a law authorizing the creation of a Board for the purpose of making such tests, and appropriating money to be expended therefor as well as in purchase of suitable machinery; and—

"*Whereas*, at a late session of Congress a law was passed, whereby said Board would cease to exist upon the expenditure of the money then appropriated; be it

"*Resolved*, that this Society deems the tests proposed to be made to be of national importance, and therefore asks that so much of the sundry civil appropriation bill, passed by Congress, as provides that the Board to test iron, steel, and other metals shall be discontinued when the money appropriated for its use shall have been expended, be repealed; that the unexpended balance to the credit of the Board be re-appropriated, and that such further appropriation be made for the use of the Board as may be needed to complete the investigations undertaken—the sum required for the coming year being $40,000.

"*Resolved*, that each member of this Society be urged to use such influence as he may possess, to obtain favorable and immediate action by the Congress of the United States in furtherance of the objects here prayed for.

"*Resolved*, that the above resolutions be printed, and several copies furnished to each member of this Society, to be used by him in promoting the object sought; and that reports of their action in the matter be made by each to the Secretary, giving names of representatives in Congress who have been addressed or seen on the subject."

The Wrong Man.

In a train that was on the way to New London, a short time ago, Governor Hubbard was a passenger. His Excellency sat quietly reading a newspaper. In a seat on the other side of the car, and at the rear of the Governor, sat our old friend Clark, of Chester, and Mr. S. H. Scranton, of Madison. The former, who had just been using his handkerchief, said to Mr. Scranton, with a slight flirt of the hand kerchief in the intended direction, "That's Gov. Hubbard."

"Is it, indeed?" said Scranton; "I've been waiting to see him and get acquainted with him, and I'll speak to him."

Whereupon Mr. S. quietly went three seats ahead and addressed Railroad Commissioner Arnold, of Haddam:

"Good morning, Governor Hubbard; I've been waiting to make your acquaintance; I am S. H. Scranton, of Madison."

Mr. Arnold stared, but bowed; and his new friend proceeded:

"The fact is, Governor, I'm just as much a of a Democrat as a Republican; I vote to suit myself. I've been thinking, Governor, that I would like an appointment on the Railroad Commission, and if you can fill the next vacancy with my appointment I would feel much gratified."

Mr. Arnold bowed again.

"The fact is, Governor," his new acquaintance proceeded, "the truth is, the present commission don't practically amount to much, especially Arnold. He ain't worth a row of pins. He just goes over the road, takes up a tie here and there, glances at the bridge timbers, perhaps, and is off again. What does such an examination amount to? Now, if I get his place I'll promise you there shall be real service rendered. I'm a practical railroad man."

Mr. Arnold, being now thoroughly convinced of the real situation, blandly bowed again—a sort of bow of encouragement—and said he'd think it over; and Mr. Scranton went back, well pleased at the prospect. It is said that the story would never have got out but for the fun-enjoying Clark.—*Hartford (Conn.) Times.*

Fast Time with a Heavy Train.

The Altoona (Pa.) *Sun* of May 17 says: "On Friday night of last week fast line west was consolidated from two sections into one in this city, and notwithstanding the train was made up of thirteen cars, of which eight were twelve-wheel cars, carrying over 300 passengers, it made the run from this city to Pittsburgh in the extraordinary fast time of three hours and twenty-five minutes. Considering the number of cars to the train, and the distance—117 miles—the run is looked upon as the greatest on record on the Pennsylvania Railroad. The engine which accomplished the feat was No. 654, in charge of that veteran engineer, Thomas Ridley. Conductor Wherry had charge of the train."

Standard-Gauge Cars on Narrow-Gauge Tracks.

In the *Railroad Gazette* of April 19 we mentioned a contrivance for carrying standard-gauge cars over a narrow-gauge road invented by Superintendent Ihling, of the Paw Paw Railroad. A dispatch from Lawton, Mich., May 20, thus speaks of a trial of this invention:

"A Michigan Central Railroad car went to Paw Paw over the narrow-gauge on Ihling's adjustable truck to-day. A broad-gauge car got on a narrow-gauge truck by the double track. The inner track, narrow-gauge, was laid on an incline. When the car is drawn forward, the narrow-gauge truck going up the incline comes to place under the car, and lifting it from the track, carries it. The experiment was a complete success. No transfer of freight at Lawton will be made for freight in bulk."

A Problem.

A correspondent sends the following problem: "A mail train upon a railway starts a certain time after a freight train, from the same terminus, and the time is so adjusted that, before arriving at the other terminus, the trains will exactly escape collision and no more. It happens, however, that from an accident, the speed of the freight train is suddenly reduced one-half, after performing two-thirds of the journey, and a collision takes place a miles from the end of it. The proper speeds of the trains being m and n ($m<n$), find the length of the railway, and the difference of the times of starting (m and n denote miles per hour)."

It is submitted to our mathematical readers for solution.

Notes

For real fresh, sensational railroad news there is no place like the baggage car of a local train. Startling information about intended leases and purchases can be picked up there, and wonderful stories heard about the inner life and real motives of railroad magnates. True, these baggage-car prophecies do not always come true, but then that is the fault of the railroad magnates aforesaid, who do not do what is clearly their duty.

A curious thing is the pertinacity with which people—and newspapers—cling to old names of railroads, and even to local abbreviations of the name. Some of the older roads in the country, and especially those which have been made up by the consolidation of several smaller ones, are known locally by half a dozen different names on different parts of their lines. This confusion of names has rather increased of late, on account of the many changes resulting from the foreclosures and reorganizations of the last few years. These local names are very puzzling to searchers after railroad news who are not familiar with local history, and we know of at least one instance where a so-called reliable railroad directory gives the same road twice, once under its right name and once under its common local name.

It is to be regretted that the new owners of the Erie did not recognize this fact in selecting a name for the new company. "New York, Lake Erie & Western" is too cumbrous a title ever to replace the old name, and in common speech the road will continue to be "the Erie" for many years, if not always.

Some tremendous extensions of road may be looked for soon, for an exchange informs us that "Corning & Co., of Troy, are filling an order for 500,000 tons of steel rails for the Central Pacific Railroad. After this is executed they will make 600,000 tons for the Erie road."

Perhaps it would be well to drop a couple of ciphers from each order.

OLD AND NEW ROADS.

Ashtabula, Youngstown & Pittsburgh.—An adjourned meeting of bondholders was held in Philadelphia, May 16, when the committee appointed at a previous meeting presented a report. The committee recommended that the first mortgage be foreclosed and a new company be organized, bondholders to take preferred stock in the new company, and common stock to be issued for a part of the present stock. The report was approved and a committee appointed to foreclose the mortgage and organize the new company. The road, which is worked by the Pennsylvania Company, extends from Youngstown, O., to Ashtabula Harbor, 62½ miles; it has a bonded debt of $1,500,000 first and $500,000 second-mortgage bonds.

Baltimore & Hanover.—The contract for grading the section of two miles, from Maple Swamp to Hampstead, Mo., was last week let to Cyrus Diller and Nicholas Fleigle. Some seven miles more, to Emory Grove, will be let shortly.

Brotherhood of Locomotive Engineers.—The Pittsburgh *Telegraph*, of May 20, says: "Division No. 50 of the Brotherhood of Locomotive Engineers, with headquarters in this city, has disbanded and surrendered its charter. It numbered 187 members last July, the principal part of them being engineers on the Pennsylvania, Panhandle, and Baltimore & Ohio railroads, though some ran on the Pittsburgh, Fort Wayne & Chicago, and Cleveland & Pittsburgh roads. This step seems to have grown out of the trouble of last July,

the action of the Division in ordering a strike having been unauthorized, and it would probably have been obliged to surrender its charter."

Chatfield.—The Chatfield Railroad Company has been organized to build a road from Chatfield, Minn., south about nine miles, to a connection with the Southern Minnesota, with a possible extension north some 15 miles to the Winona & St. Peter.

Chesapeake & Ohio.—The Virginia Circuit Court has entered a decree approving and confirming the sale of this road to the Purchasing Committee for the bondholders. The committee can now proceed at once to complete the reorganization of the company.

Chesapeake & Ohio Canal.—At a meeting of the board in Baltimore last week, it was decided to issue at present only half of the $500,000 bonds authorized by the Legislature of Maryland for the purpose of repairing the canal and making additions to it. The President and Secretary were therefore instructed to sign only $250,000 of the new bonds.

Chicago & Lake Huron.—The Port Huron (Mich.) *Times* says: "Last week in the United States District Court at Detroit, an order was issued to Receiver Peck, of the Chicago & Lake Huron Railroad, to take possession of the papers of the late Receiver, Mr. W. L. Bancroft, and hold them as custodian. This order was obeyed by Receiver Peck and for several days past the rooms in which the papers of the late Receiver are stored, in this city, have been locked, and all persons have been excluded from them. It is understood that the papers are to be examined by attorneys representing the Albany bondholders, in company with Mr. Bancroft and his representatives, and that the future action of the Court will depend upon the report that may be made after such examination."

Chicago & Michigan Lake Shore.—A recent circular to bondholders states that the experience of the past year confirms the opinion of the directors, that the only practicable mode of reorganizing the company is to turn its mortgage securities into stock of equal amount, the stock of the old company being extinguished by foreclosure sale. The circular says: "It would be out of the question to fix any sum at all proportionate to the present mortgage debt upon which the prompt payment of interest in future could be guaranteed with any degree of certainty. Meanwhile, if the present bonds are converted into stock, it will be possible to pay out to the holders thereof, in the form of dividends, any net earnings which may be available for that purpose. Though regular interest cannot be guaranteed, it is not at all unlikely that small cash dividends may from time to time be paid, thus giving the owners of the property some prospect of a return from it. It is not apparent now this can be done in any other way than that now suggested."

The funded debt consists of a first mortgage for $477,000, and three other mortgages, one for $3,523,000, one for $1,350,000, and one for $1,280,000, each having a prior lien upon some part of the property. Of the first the circular says: "The mortgage debt of about $477,000 upon the outlet of the road to Chicago from New Buffalo to St. Joseph is not only a lien upon the property between these points, but is also a first mortgage upon the road from St. Joseph to Muskegon. For these reasons, its annual interest, amounting to $38,160, has been reluctantly paid, both while this road was in the hands of the company and also under order of the Court by the Receiver."

Leaving this mortgage of $477,000 as it now is, it is proposed to all the other mortgage bondholders to exchange their bonds, dollar for dollar, for one class of common stock, at par, in a new company to be organized as soon as possible. Each holder of a $1,000 bond, with all over-due coupons attached, would receive therefor $1,000 in the stock of the new company at par.

Chicago, Milwaukee & St. Paul.—The grading on the extension of this company's Hastings & Dakota Division is now completed for 30 miles westward from Glencoe, Minn. Work is being pushed toward the Minnesota River at Granite Falls.

Chippewa Valley & Minnesota.—This company has filed articles of incorporation in Wisconsin to build a road from Pepin on the Mississippi by way of Eau Claire to Marathon on the Wisconsin Central, with branches to Bayfield and Ashland; to Menominee; to Durand and Mondovi; and on the western end to Winona, Minn. The length of the road to be built is 350 miles, and the capital stock is to be $6,000,000. The corporators are Wm. Thompson, Thomas B. Wilson and S. W. Hunt, of Menominee; H. P. Graham, D. Kennedy, G. A. Buffington, R. F. Wilson and Daniel Shaw, of Eau Claire, Wis.

Central Branch, Union Pacific.—Contracts have been let for the grading, bridging and track-laying of an extension from the present terminus at Concordia, Kan., westward to Beloit, in the Solomon Valley, a distance of 28 miles.

Cincinnati & Portsmouth.—Work was some time since resumed on this road and the grading is now nearly completed from the terminus at Mt. Carmel, O., east to Amelia, nine miles. Tracklaying will begin as soon as some trestles now in progress are done. Work is also in progress on the grading from Amelia to Hamersville, 14 miles.

Cincinnati, Sandusky & Cleveland.—Arrangements are being made to change the track of this road from the old Ohio gauge of 4 ft. 10 in to 4 ft. 9 in., which is now the gauge of most of its connections.

Cincinnati Southern.—The Ohio Legislature has passed a new bill providing for the completion of this road. The bill authorizes the issue of bonds not to exceed $2,000,000 in amount, to be sold at not less than par in lawful money and not to bear a higher rate of interest than 7 per cent. per annum. The trustees are to advertise for proposals for the completion of the road, and are to accept the bid in their judgment the lowest and best. Satisfactory security is to be given for the performance of the contract, and no bid exceeding $2,000,000 can be entertained. When a bid shall have been accepted by the trustees, an election is to be held in Cincinnati to determine the question of finishing the road, and the bonds cannot be issued unless a majority of the voters shall have voted yes. The proceeds of the bonds can only be applied to the completion of the road, with the exception of $50,000, which may be expended in terminal facilities, and in purchase of rights of way.

It is thought that the provisions of this bill will remove some of the objections to the former bill, which resulted in a majority vote against the issue of the bonds.

Mr. R. T. Wilson, President of the East Tennessee, Virginia & Georgia company, has offered to extend the Knoxville & Ohio road from its present terminus at Careyville, Tenn., to the line of this road at Chitwood, a distance of 26 miles, provided the trustees will lay the track on the Southern road from the present terminus below Somerset to Chitwood, for which they have already rails enough on hand. By this arrangement, Mr. Wilson urges, a line through to Chattanooga can be secured at a very small outlay, and also an excellent connection for Knoxville and East Tennessee business. The Knoxville & Ohio and the East Tennessee companies will give all reasonable facilities for exchange of business.

Columbus, Chicago & Indiana Central.—The long pending suit to enforce the guarantee of the Pennsylvania Railroad Company on the lease of this road to the Pittsburgh, Cincinnati & St. Louis has been again postponed. It was to have been heard at the present term of the United States Circuit Court in Indianapolis, but was put over on account of the illness of Judge Drummond. It will come up for hearing at the August term, but no day has been set.

Corning, Cowanesque & Antrim.—The repair shops of this road at Corning, N. Y., caught fire on the morning of May 20, and the car shop was entirely destroyed. The blacksmith shop and round-house were saved, as were all the engines and cars. The loss is estimated at $30,000, about $25,000 being covered by insurance.

Corpus Christi, San Diego & Rio Grande.—This road was to have been sold last week under a judgment granted by the United States District Court, but a few days before the sale the company secured funds and paid up the amount of the claim, and all proceedings were discontinued. Arrangements have been made to resume work on the road.

Des Moines & Minnesota.—Surveys are being made for the extension of this road from Lakin, Ia., northward to the state line. The road is in operation from Des Moines northward to Lakin, 60 miles.

Eastern Extension.—The rails for this Nova Scotia road are now being delivered at Pictou and carried over the Intercolonial road to New Glasgow. Tracklaying will soon be begun at that point.

Edgefield Branch.—This company has been organized at Edgefield, S. C., for the purpose of building a railroad from that town to the Charlotte, Columbia & Augusta, at Pine House. The distance is about eight miles.

Elberton Air Line.—This company has now a considerable force at work getting out ties along its line. Arrangements have been made for the iron, the first of it to be delivered in June. The grading has been done for some months, and the company hopes to have trains running this season. The road is to extend from Elberton, Ga., northwest to the Atlanta & Charlotte Air Line at Toccoa, a distance of about 50 miles.

Erie.—The court has fixed the fee of the referee who sold this road under the foreclosure decree (Mr. George T. Curtis) at $13,500, with an additional allowance of $3,500 for clerk hire. The referee made no claim for a percentage on the property, but left the question of compensation entirely to the court.

Illinois Central.—This company last week began sending a part of the freight traffic between Chicago and its Iowa Division over the Chicago & Northwestern road between Freeport and Chicago. It is said that under the new arrangement two-thirds of the freight will go over the Northwestern, the Chicago & Iowa continuing to carry the passenger business and one-third of the freight.

Indianapolis, Cincinnati & Lafayette.—All through trains, both passenger and freight, are now run over the new cut-off line from Guilford to North Bend, which shortens the distance between Cincinnati and Indianapolis some eight miles, avoiding the long detour by Lawrenceburg. Local trains are still run over the old road to Lawrenceburg. Track has been laid on the new line for several months.

The Receiver reports for April receipts from all sources of $183,270.40, and disbursements amounting to $166,823.25.

Iron Mountain, Chester & Eastern.—The purchasers of this road have organized a new company known as the Wabash, Chester & Western. The road, originally the Chester & Tamaroa, is in operation from the Illinois Central at Tamaroa, Ill., west by south to Chester 41 miles. The new company has also bought the unfinished Chester & Kaskaskia road, from Chester west by north to Kaskaskia, seven miles.

Kendall & Eldred.—Work has been begun on this narrow-gauge road by the contractors, Craigie & Rafferty, of Buffalo, N. Y., and the intention is to have it finished by June 1. The line is from Kendall, N. Y., through the valleys of Boyd's and Knapp's creeks, to Eldred Pa., on the Buffalo, New York & Philadelphia road. The road will be 15 miles long and run near the line between New York and Philadelphia. It will serve a part of the Bradford oil region. The road is through a rough and hilly country, and will have grades as high as 130 feet to the mile. The incorporators are almost all interested in the Olean, Bradford & Warren road.

Keokuk & Des Moines.—A dispatch from Des Moines, Ia., May 17, says that an agreement to lease this road to the Chicago, Rock Island & Pacific Company has been concluded, the lessee to take possession Oct. 1. This report has since been confirmed, but the terms of the lease are not made public.

The Keokuk & Des Moines road is the Southern Division of the old Des Moines Valley road, the present company having been organized some years ago by the bondholders, who bought the road at foreclosure sale. It is 160 miles long, from Keokuk, Ia., northwest to Des Moines; the company's stock is $3,924,000, and its bonded debt $2,754,800. For the year ending March 31, 1877, the road earned $581,999 gross, and $170,423 net; in 1875-76, it earned $741,339 gross, and $226,838 net. It comes into competition with the Rock Island road not only at Des Moines, but at Oskaloosa and Ashland on the Knoxville and Southwestern branches, and the desire to prevent competition and control the business is probably one motive for the lease.

Keystone Coal Co.—This company now has a narrow-gauge road 5½ miles long from its mines to Keystone Junction, Pa., two miles west of Sand Patch Tunnel on the Pittsburgh & Connellsville road. The company is having surveys made for an extension from Keystone Junction along Flaugherty Creek and over the Savage Mountain to a connection with the Cumberland & Pennsylvania near Mt. Savage Junction. The object is to secure a second outlet over which their coal can be shipped.

Lafayette, Muncie & Bloomington.—Receiver Chapman reports for the month of April as follows:

Balance, April 1	$25,113.11
Receipts	49,493.55
Total	$74,606.66
Disbursements on all accounts	59,622.90
Balance May 1	$14,983.76

The disbursements were $10,129.35 in excess of the receipts.

Lake View & Collamer.—Proceedings are in progress to foreclose the second mortgage on this suburban line from Cleveland, O., to Euclid. The first-mortgage bondholders met in Cleveland, May 20, and agreed to pay an assessment for the purpose of buying in the road when it is sold.

Missouri, Kansas & Texas.—Notice is given that 22 Boonville Bridge bonds have been drawn for redemption and will be paid on presentation at the office of the Union Trust Company in New York. Interest on these bonds will cease July 17. The numbers drawn are: 53, 67, 92, 97, 134, 148, 164, 182, 210, 336, 476, 497, 601, 620, 636, 724, 759, 760, 780, 807, 889, 991.

Montreal, Portland & Boston.—The case of this company has been further complicated by an order from the Canadian Government, prohibiting the running of trains, the Government Engineer having condemned the road as unsafe. No trains will be run over it until further notice.

Pennsylvania.—Work has been begun on the grading of the extension of the Bedford Division from its present terminus at State Line, to Cumberland, Md., a distance of 6¼ miles. This extension will give the company a line to Cumberland independent of any other road. It is built by a separate organization, known as the Pennsylvania Railroad Company in Maryland, but will be controlled and worked by the Pennsylvania Railroad Company. The city of Cumberland subscribes $65,000 in aid of the road. Some heavy work is required in its construction.

Petersburg.—A movement is reported among holders of the second-mortgage bonds looking to the foreclosure of their mortgage and the purchase of the road, to be followed by the organization of a new company. The road has been in the hands of a receiver over a year. By the report for the year ending Sept. 30, 1877, there were outstanding $500,000 first and $457,000 second-mortgage bonds, besides $53,500 third mortgage bonds and $323,500 preferred stock secured by mortgage. The net earnings for the year were $66,277, or more than sufficient to pay the interest (8 per cent.) on the first-mortgage bonds.

Philadelphia & Cape May Short Line.—The Trenton (N. J.) *State Gazette* says: "Attorney General Stockton has notified the President of the projected narrow-gauge railroad between Philadelphia and Cape May, that in consequence of no deposit having been made with the Treasurer of the State, as required by the recent amended general railroad act, 'the corporate powers invested in said company have become extinct, and the corporation is dissolved.' The President, Charles K. Landis, has written a strong protest to the Attorney General against this action."

Philadelphia & Erie.—At the annual meeting in February last some objections were made to receiving or approving the reports submitted by the board for the reason that such action might affect a suit pending as to the validity of preferred stock issued to the Pennsylvania Railroad Company. An adjourned meeting was held in Philadelphia, May 16, to consider this question further, but no action was taken. It was stated that the action of the stockholders would not affect the suit in any way.

Pittsburgh, Cincinnati & St. Louis.—This company's statement for the four months ending April 30, is as follows:

Gross earnings	$1,050,643
Expenses (59.06 per cent.)	620,682
Net earnings	$429,961
Interest on bonds, four months	223,263
Surplus	$206,698

Gross earnings include interest received on equipment, and expenses include interest on car-trust cars and rental of Monongahela Extension.

Port Royal.—Notice is given that bondholders who have not yet proved their bonds must do so before James Simons, Jr., Referee, in the foreclosure suit, at his office, No. 77 Broad street, Charleston, S. C., before June 27.

Railroads in Washington Territory.—The Seattle (Wash. Ter.) *Pacific Tribune* gives the following statement of railroad mileage in the territory:

"Washington Territory contains six pieces of railroad, the aggregate length of which is 194 miles. The oldest and shortest of these pieces is 6 miles in length, around the lower Cascades of the Columbia, and was built and is owned by the Oregon Steam Navigation Company. The next piece is that section of the Northern Pacific between Kalama and Tacoma, 105 miles, which, with a 31-mile section from Tacoma to Wilkeson, built last year, and the lower Cascades road, comprises all that we now possess of standard gauge. The Walla Walla & Columbia River Railroad, connecting the town of Walla Walla and Wallula, is of narrow gauge and 31 miles in length, and the Seattle & Walla Walla Railroad, running from Seattle to Talbot, Renton and Newcastle is also of narrow gauge, and is 21 miles in length. The only road now building in the Territory is the Thurston County, from Olympia to Tenino, a narrow gauge and 15 miles in length. The Union and Northern Pacific companies, and the Walla Walla and Seattle companies are looking forward to great extensions during the year ensuing, and it is but a reasonable prediction to make that our railroad system will surely be doubled before the 1st of January, 1880."

Rochester & State Line.—This road was formally opened last week by an excursion over the line, and regular trains began to run through May 16. The rails were all laid early in January and some through freight has been carried, but no regular trains have run through until now, although the Rochester end of the road has been worked more than a year. The road is 108 miles long, from Rochester, N. Y., to Salamanca, where it connects with the Erie and the Atlantic & Great Western. If reports can be credited, it is to be worked in close connection with the New York Central, and as a connecting link between that road and the Atlantic & Great Western. It is also expected to have a considerable oil traffic from the Bradford and Tuna Valley regions.

Savannah, Griffin & North Alabama.—Mr. Wm. M. Wadley, President, will receive bids until June 3 for filling ten trestles on this road, about 218,000 cubic feet in all. The earth will be taken from cuttings on the line of road to be designated, as the work progresses and in accordance with directions of the officer of the company in charge. Each trestle will be filled uniformly to the depth of from 6 to 10 feet, then left until all have been so filled, when they will again be gone over as at first and so continued until the work is complete. The right will be reserved to designate the order of filling the trestle. The contractors will be required to put in turnouts, wherever they are wanted for his convenience, the company to furnish the iron, ties and spikes. The company will furnish an engine, engineman and fireman, with six cars, doing all ordinary repairs on the engine and cars, but if they are damaged by the contractor the repairs will be at his expense. Monthly payments of 80 per cent. on the work done will be made in cash.

The company's office is at Griffin, Ga.

Southern Minnesota.—A considerable force is now at work grading the extension of this road from Winnebago City, Minn., westward.

Southern Pacific.—In Washington last week the Senate Military Committee heard arguments as to the right of this company to build its bridge over the Colorado River and run its track across the military reservation at Fort Yuma.

On behalf of the company it was urged that existing laws were fully sufficient to authorize the bridge and crossing; that no one was injured thereby, and that the bridge was a great and necessary public convenience. It was also charged that the opposition of the Texas & Pacific was vexatious and for sinister purposes.

Southwestern Railway Association.—At a meeting held in Chicago, May 17, it was decided to make no change in rates at present. It was ordered that each road in the Association should submit daily reports of the amount of freight carried, west-bound freight to be reported to Commissioner Midgely in Chicago, and east-bound freight to General Agents Courtwright and Crampton. The next meeting will be held in St. Louis, May 28.

Spencer.—This company has completed its organization and secured the necessary certificates. Contracts have been let for the grading, and work will soon be begun. The road will be 2¼ miles long, from Spencer, Mass., to Spencer station on the Boston & Albany.

Standard Oil Co.—At Pittsburgh, May 20, the United States Circuit Court granted an order removing the suit of Taylor, Satterfield & Co. against this company from the Butler County Circuit to the United States Court. The company will at once move for an order dismissing the Receiver appointed by the State Court.

Texas Passenger Tickets.—The following joint circular, relating to limitations of passenger tickets, is dated May 8 and signed by the representatives of the Galveston, Harrisburg & San Antonio, the Houston & Texas Central, the International & Great Northern, the Galveston, Houston & Henderson and the Texas & Pacific companies:

"There having been some misunderstanding by connecting roads as to the import of our joint circular, dated Jan. 15, 1878, we have deemed it necessary to issue the following:

"Hereafter no ticket will be accepted for more than one passenger, except in transportation of United States troops, when the whole number may be put on one ticket, and any person presenting a ticket with more than one seat upon it, except in transportation of United States troops, will be charged for all additional seats."

Wabash.—Recently Mr. Thornton, of Buffalo sued this company to recover damages for the loss of certain stock held by him in the old Toledo, Wabash & Western Company. He claimed that he had not had sufficient notice to enable him to convert his stock into that of the new company under the agreement, and that the time was purposely made short in order to enable certain parties to secure control of the new company. The Court has now dismissed the suit, holding that plaintiff has no right of action against the company, although he may have against the Purchasing Committee who managed the reorganization.

The suit brought in Indiana, similar in its nature to the one in Illinois, was before the Fountain County Circuit Court last week, when an order was granted removing it to the United States Circuit Court.

West End.—A commisson has been appointed to condemn lands for this road, which is to extend the New Jersey Southern to the lower end of Long Branch. Some of the property owners on the line are very strongly opposed to the new road, and it is also opposed by the New Jersey Central, to whose line it will be parallel.

ANNUAL REPORTS.

Pittsburgh, Fort Wayne & Chicago.

This company owns a line from Pittsburgh to Chicago, 468.39 miles, and it leases the New Castle & Beaver Valley road, from Homewood, Pa., to New Castle, 14.9 miles, and the Lawrence road, from Lawrence Junction, Pa., to Youngstown, O., 22.04 miles. Its tracks are used by the Cleveland & Pittsburgh trains between Pittsburgh and Rochester, 26 miles. The whole property is leased to and worked by the Pennsylvania Company. The following statements are from the reports made at the recent annual meeting for the year ending Dec. 31, 1877.

The earnings and expenses of the main line, 468.39 miles, were as follows:

	1877.	1876.	Decrease.	P. c.
Gross earnings	$6,928,856.11	$7,853,848.91	$924,992.80	11.8
Expenses	4,064,398.34	4,787,161.37	722,763.03	15.1
Net earnings	$2,864,457.77	$3,066,687.54	$202,229.77	6.6
Gross earn. per mile	14,792.94	16,767.75	1,974.81	11.8
Net earn. per mile	6,115.54	6,547.29	431.75	6.6
Per cent. of exps.	58.65	60.95	2.30	3.8

The result of the year's operations to the lessee was as follows:

Net earnings, as above		$2,864,457.77
Net gain, New Castle & Beaver Valley R. R		67,021.42
" Lawrence R. R.		24,667.48
Total		$2,956,146.67
Paid Cleveland & Pittsburgh, joint earnings	$61,492.07	
Tax on capital stock	11,179.30	
		72,671.37
Net balance		$2,883,475.30
Interest, dividends and other rental charges		2,732,453.75
Net profit to lessee		$151,022.05

The report states that the stock capital now amounts to $25,218,585.71 ($53,841 per mile), of which $19,914,285.71 is old stock, and $5,000,000 special guaranteed stock.

The trustees report that they now hold $992,000 bonds for the first-mortgage sinking fund and $994,000 in the second-mortgage sinking fund, being $1,986,000 in all besides cash on hand, $171,755.36, making the total amount of the sinking fund Dec. 31, $2,157,755.36. The annual payments to the sinking fund are included in the rental charges above. The amount of bonds in the sinking funds was increased by $235,500 during the year.

Concord.

This company works the following lines:

	Miles.
Concord R. R., owned, Concord, N. H., to Nashua	35.0
Manchester & North Weare R. R., owned	19.0
Concord & Portsmouth, leased, Manchester, N. H., to Portsmouth	40.5
Suncook Valley R. R., leased, Hooksett, N. H., to Pittsfield	19.5
Total	114.0

The Manchester & North Weare maintains a formal organization. The company also works the Nashua, Acton & Boston road, 20 miles, under lease, but its accounts, we believe, are not included in the statements given. The report is for the year ending March 31.

The equipment consists of 38 locomotives; 44 passenger and 16 baggage and mail cars; 4 milk, 219 box, 532 platform, 157 coal and 10 freight saloon cars; 1 construction and 23 gravel cars.

The general account at the close of the year was as follows:

Stock ($27,778 per mile)		$1,500,000.00
Contingent account		129,120.66
Notes payable		92,936.22
Interest account		46,747.36
Income for May dividend		75,000.00
Unclaimed dividends		2,951.00
Total ($34,199 per mile)		$1,846,755.24
Construction ($27,778 per mile)	$1,500,000.00	
Rindge's wharf, Portsmouth	51,507.72	
Leased lines	138,672.90	
Notes receivable	70,483.57	
Cash	86,091.05	
		1,846,755.24

The company has no funded debt whatever. Fuel and materials on hand at the close of the year were valued at $184,956.74, being a decrease of $12,306.46 from the preceding year.

The earnings for the year were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passengers	$286,081.09	$320,829.82	D. $34,748.73	10.8
Freight	452,046.07	519,367.92	D. 67,321.85	13.0
Express and mails	29,097.28	27,551.70	I. 1,545.58	11.0
Rents	3,947.14	3,778.64	I 168.50	4.4
Total	$771,171.58	$871,528.08	D. $100,356.50	11.5
Expenses	430,717.65	576,766.75	D. 146,049.10	25.3
Net earnings	$340,453.93	$294,761.33	I. $45,692.60	15.5
Gross earnings per mile	6,764.66	7,644.98	D. 880.32	11.5
Net earnings per mile	2,986.44	2,585.63	I. 400.81	15.5
Per cent. of exps.	55.85	66.18	D. 10.33	15.6

The decrease in passenger earnings came from diminished business; that in freight earnings was wholly from lower rates, the bulk of traffic having increased. The disposition of net earnings was as follows:

Net earnings		$340,453.93
Tax on capital stock	33,316.48	
Manchester & Lawrence R. R. on joint business	70,855.65	
Rent of Concord & Portsmouth R. R	25,000.00	
Rent of Suncook Valley R. R.	8,094.00	
Paid on account of Nashua, Acton & Boston rolling stock	20,000.00	
Dividends, 10 per cent	150,000.00	
		307,266.13
Balance		$33,187.80
Reserved for new locomotives and new rails		32,500.00
Balance to contingent account		$687.80

The traffic for the year was as follows:

Train mileage:	1877-78.	1876-77.	Inc. or Dec.	P.c.
Passenger	202,837	228,013	D. 25,176	11.0
Freight	255,319	254,888	I. 431	0.2
Service	24,178	52,340	D. 28,162	53.8
Switching	135,020	135,045	D. 25	....
Total	617,354	670,286	D. 52,932	7.9
Passengers carried	509,203	529,335	D. 20,132	3.8
Passenger mileage	10,856,140	12,067,832	D. 1,211,692	10.0
Tons freight carried	673,471	612,756	I. 60,715	9.9
Tonnage mileage	21,634,669	19,111,714	I. 2,522,955	13.2
Average train load:				
Passengers, number	53.52	52.93	I. 0.59	1.1
Freight, tons	84.74	74.98	I. 9.76	13.0

The total traffic last year was equivalent to 130.45 passengers and 259.97 tons of freight carried each way daily over the entire length of road worked.

The working expenses were very largely reduced by cutting down train-service and by close economy in management, assisted by the reduced cost of materials. In this way the company was enabled to maintain the usual dividends, notwithstanding the reduction in gross earnings. The lease of the Nashua, Acton & Boston has proved profitable, chiefly by enabling the company to keep control of its connections and consequently, in a great measure, of rates.

Renewals during the year included 456 tons of iron and 501 tons of steel rails, and 62,308 new ties. Extensive repairs were made to Goff's Falls and Hooksett bridges and the pile bridges on the Suncook Valley road. The earnings have not been large enough to warrant the commencement of the new stations at Concord and Nashua, both much needed.

Atchison, Topeka & Santa Fe.

This company operates the following lines:

	Miles.
Main Line owned, Atchison, Kan., to western boundary of the State	471
Pueblo & Arkansas Valley, leased, Kansas line to Pueblo, Col	147
Total Main Line, Atchison to Pueblo	618
Kansas City, Topeka & Western, Topeka to Kansas City	66
Pleasant Hill & De Soto, De Soto, Kan., to Pleasant Hill, Mo.	45
Florence, Eldorado & Walnut Valley, Florence, Kan., to Eldorado	30
Wichita & Southwestern, Newton, Kan., to Wichita	27
Total	786

The Florence, Eldorado & Walnut Valley and the Pleasant Hill & De Soto were added to the roads worked during the year, so that the average mileage for the year ending Dec. 31, 1877, was 738⅓ miles.

The equipment consists of 61 engines; 7 sleeping, 29 passenger and 16 baggage, mail and express cars; 553 box and combination, 100 stock, 400 coal, 46 flat and 24 caboose and way cars; 1 pay and 2 boarding cars, and 199 hand and push cars. Of this equipment 18 engines, 9 passenger and 8 baggage and mail cars, 230 box and combination, 97 coal and 10 caboose cars are leased from the Topeka Equipment Company under a contract by which they will finally become the property of the company.

The company has a great and valuable land grant. Patents have been received from the Government for 2,474,326 acres, leaving 458,458 acres more due. The total sales up to the close of 1877 were 643,599 acres, of which 85,048 acres were sold during the year. The total cash receipts for 1877 on land contracts were $353,314.36; expenses of Land Department, $91,388.30. The company holds $2,271,047.63 in land notes, payable at different dates.

The general balance sheet (condensed) is as follows:

Stock ($18,291 per mile owned)		$8,615,000.00
Bonds ($31,158 per mile)		14,6 5,500.00
Notes, accounts and scrip payable		701,094.18
Unpaid coupons and scrip		302,464.09
Balance of income account		134,512.06
Total ($51,865 per mile)		$24,428,570.33
Construction ($49,783 per mile)	$23,447,810.64	
Land Department and other accounts	544,666.46	
Stocks owned	51,723.17	
Cash and Treasurer's balance	384,370.06	
		24,428,570.33

During the year $47,500 of the Pottawottomie land bonds were canceled. These bonds were used in the building of the road and charged to construction account; as fast as canceled they are credited to the same account. Expenditures for new construction and equipment were $56,212.96, including $30,000 paid under contract with Topeka Equipment Company.

The earnings for the year were as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Passengers	$738,930.41	$715,699.93	I. $23,230.48	3.2
Freight	1,853,348.33	1,688,107.33	I. 165,141.00	9.8
Mail, express, etc	86,927.77	82,775.40	I. 4,152.37	5.0
Total	$2,679,106.51	$2,486,582.66	I. $192,523.85	7.7
Working expenses	1,318,285.12	1,175,489.01	I. 142,796.11	12.0
Taxes and insurance	141,217.82	127,171.67	I. 14,046.15	11.0
Total	$1,459,502.94	$1,302,660.68	I. $156,842.26	12.0
Net earnings	$1,219,603.57	$1,183,921.98	I. $35,681.59	3.0
Gross earn. per mile	3,627.77	3,567.55	I. 60.22	1.7
Net earn. per mile	1,651.46	1,698.60	D. 47.14	2.8
Per cent. working expenses	49.37	47.27	I. 2.10	4.4
Per cent. all expenses	54.47	52.38	I. 2.09	4.0

The average mileage for 1876 was 697 miles. The disposition of net earnings was as follows:

Net earnings		$1,219,603.57
Rentals of leased lines	$330,644.12	
Less rebate on Pueblo & Ark. Valley	50,723.17	
Balance, rentals paid	$279,920.95	
Rent of rolling stock	27,750.00	
Coupons and premium	859,386.53	
Other interest	14,124.30	
Boston office expenses	17,732.90	
		1,198,914.68
Balance to credit of new account		$20,688.89

The work done was as follows:

Train mileage:	1877.	1876.	Inc. or Dec.	P.c.
Freight	1,120,178	1,030,583	I. 89,595	8.7
Passenger	676,391	640,338	I. 36,053	5.6
Total	1,796,569	1,670,921	I. 125,648	7.5
Passenger car mileage	2,890,032	2,559,798	I. 330,234	12.9
Freight car mileage	13,717,413	13,046,553	I. 670,860	5.1
Passengers carried	165,318	133,727	I. 31,591	23.6
Passenger mileage	22,008,546	17,031,491	I. 4,977,058	29.2
Tons freight carried	372,084	325,624	I. 46,460	14.3
Tonnage mileage	72,719,170	61,791,130	I. 10,928,040	17.7
Average train:				
Passenger, cars	4.81	4.32	I. 0.49	11.3
Freight, cars	12.69	12.28	I. 0.41	3.3
Average train load:				
Passengers, No	32.54	26.60	I. 5.94	22.3
Freight, tons	64.56	59.96	I. 4.60	7.7
Average rate per mile.				
Per passenger	3.357 cts.	4.202 cts.	D. 0.845 ct.	20.1
Per ton of freight	2.550 "	2.730 "	D. 0.180 "	6.6

General Superintendent Morse reports that 16 miles of track were relaid with 56-lb. steel rails, and 14 miles with rerolled iron. Full renewals of ties were made, and an unusual amount of bridge work was made necessary by freshets. Buildings have been fully maintained. Additional shop room is much needed, and at least eight new freight engines, 200 box and 100 coal cars. The eastern end of the road, where the country is becoming well settled, needs fencing. The report gives very full statements as to condition of the property, bridges, etc.

The President's report mentions the lease of the new Florence, Eldorado & Walnut Valley road, and of the Pleasant Hill & De Soto, formerly part of the St. Louis, Lawrence & Western road. The only statement as to the new extensions is as follows: "In accordance with the design of the original projectors of the road, the directors have matured a plan to extend your line into New Mexico, to the vicinity of Santa Fe, in the year 1878, and they trust that this movement will be approved and supported by the stockholders of the road."

New Haven & Northampton.

This company owns a line from New Haven, Conn., northward to Northampton, Mass., 83.88 miles, with a branch from Farmington, Conn., to New Hartford, 14.09 miles, and it leases the Holyoke & Westfield road, 10.32 miles, making 97.97 miles owned and 108.29 worked. The line is equipped with 20 engines, 1 snow-plow, 18 passenger and 8 baggage cars; 105 box, 302 flat and 7 caboose cars; 1 tool, 1 derrick and 40 gravel cars. The report is for the year ending Sept. 30, 1877, at the close of which the capital account was as follows:

Stock ($25,110 per mile)		$2,460,000.00
Bonds ($22,262 per mile)		2,181,000.00
Bills, accounts and balances payable		234,751.19
Income account		40,330.25
Total ($50,179 per mile)		$4,916,081.44
Road and equipment ($49,278 per mile)	$4,827,748.83	
Stock owned	20,000.00	
Cash, materials and balances	68,332.61	
		$4,916,081.44

The bonded debt was decreased by $18,000 during the year. The work done was as follows:

	1876-77.	1875-76.	Inc. or Dec.	P.c.
Train mileage	380,802	384,279	D. 3,477	0.9
Passengers carried	275,601	306,308	D. 30,707	10.0
Passenger mileage	4,516,618	4,626,908	D.110,290	2.4
Tons freight carried	267,424	262,871	I.. 4,553	1.7
Tonnage mileage	11,719,984	11,256,872	I..463,112	4.7
Average receipt:				
Per passenger per mile	3.00 cts.	2.97 cts.	I..0.03 ct.	1.0
Per ton per mile	3.42 "	3.43 "	D.0.01 "	0·3

There was a falling-off in pleasure and excursion travel, but an increase in freight business. The traffic was equivalent to 57.14 passengers and 148.26 tons of freight carried each way daily over the whole length of road. The earnings for the year were as follows.

	1876-77.	1875-76.	Inc. or Dec.	P. c.
Passenger Depart't.	$152,044.79	$163,872.24	D.$11,827.45	7.2
Freight Department.	409,715.69	403,794.99	I. 5,920.70	1.5
Rents	2,606.41	2,730.16	D. 123.75	4.6
Total	$564,366.89	$570,397.39	D. $6,030.50	1.1
Expenses and taxes.	352,919.89	389,815.61	D. 36,895.72	9.5
Net earnings	$211,447.00	$180,581.78	I. $30,865.22	17.1
Gross earn. per mile.	5,211.63	5,267.31	D. 55.68	1.1
Net " " "	1,952.60	1,667.58	I. 285.02	17.1
P. c. of expenses	62.53	68.34	D. 5.81	8.5

A number of minor improvements in buildings and equipment were charged to expenses instead of to construction account as heretofore. The disposition of net earnings was as follows:

Net earnings		$211,447.00
Interest on bonds	$143,680.00	
Interest and rental, Holyoke & Westfield	15,306.02	
Interest on floating debt	17,139.49	
		176,125.51
Balance to income account		$35,321.49

Charges to construction were $22,500.11 on account of New Hartford bridge. There were $39,000 bills payable paid, and $4,875 paid for real estate.

Renewals for the year included 613 tons of steel rails and 41,417 new ties, making 52 miles of the main track now laid with steel. The ditching and ballasting of the road were much improved during the year. No dividend has been earned or paid since October, 1873.